Deployment Guide

hp StorageWorks
Service Release 1 Feature Pack

Product Version: 1

First Edition (May 2004)

Part Number: 366581-001

This guide provides information to help network engineers, and Exchange and storage administrators plan for and deploy the Microsoft Windows Storage Server 2003 Feature Pack.

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Contents

About This Guide

This deployment guide provides information to help you install the Microsoft® Windows® Storage Server 2003 Feature Pack onto NAS 1200s or 2000s servers.

"About This Guide" topics include:

- Overview, page 8
- Conventions, page 10
- Getting help, page 11

Overview

This section covers the following topics:

- Intended audience
- Prerequisites
- Related documentation

Intended audience

The primary audience for this deployment guide is:

- Network engineers who plan the components and the Feature Pack deployment
- Exchange and storage administrators who perform the installation and are responsible for moving files to the Microsoft Windows Storage Server and for backing up and restoring files.

Prerequisites

This guide assumes that the reader:

- Is familiar with Exchange administration concepts
- Has experience with Windows Storage Server 2003

Related documentation

In addition to this guide, HP provides corresponding information:

Table 1: Additional documentation

Type of Document	Description
Context-Sensitive Help for the Remote Storage Wizard	The Remote Storage Wizard on the Exchange Server is a Feature Pack tool that includes context-sensitive help topics accessible by using a Help button on each wizard page.
Context-Sensitive WebUI Help	The task for creating an SMB share for use with Exchange databases and transaction logs, accessible from the Shares page of the WebUI includes context-sensitive Help topics.
Help for Remote Storage Tools For Exchange	A standalone HTML Help system (.chm) is provided for the WSSExchMove.exe command-line tool.
Windows Storage Server 2003 Feature Pack Installation Guide	The Installation Guide presents hands-on procedures for immediate use during the physical installation of the software and hardware, and for the initial transfer of files to the Windows Storage Server computer. It is included on the CD that contains the installation files for the Feature Pack, and is installed on both the Windows Storage Server computer and the Exchange server during the installation process.
Release Notes	The release notes include information about late-breaking bugs or workarounds for known issues. The file is included on the CD that contains the installation files for the Feature Pack.

Conventions

Conventions consist of the following:

- Document conventions
- Text symbols

Document conventions

This document follows the conventions in Table 2.

Table 2: Document conventions

Convention	Element
Figure 1	Cross-reference links
Bold	Menu items, buttons, and key, tab, and box names
Italics	Text emphasis and document titles in body text
`Monospace font`	User input, commands, code, file and directory names, and system responses (output and messages)
`Monospace, italic font`	Command-line and code variables
Blue underlined sans serif font text (http://www.hp.com)	Web site addresses

Text symbols

The following symbols may be found in the text of this guide. They have the following meanings:

WARNING: Text set off in this manner indicates that failure to follow directions in the warning could result in bodily harm or death.

Caution: Text set off in this manner indicates that failure to follow directions could result in damage to equipment or data.

Tip: Text in a tip provides additional help to readers by providing nonessential or optional techniques, procedures, or shortcuts.

Note: Text set off in this manner presents commentary, sidelights, or interesting points of information.

Getting help

If you still have a question after reading this guide, contact an HP authorized service provider or access our web site: http://www.hp.com.

HP technical support

Telephone numbers for worldwide technical support are listed on the following HP web site: http://www.hp.com/support/. From this web site, select the country of origin.

Note: For continuous quality improvement, calls may be recorded or monitored.

Be sure to have the following information available before calling:

- Technical support registration number (if applicable)
- Product serial numbers
- Product model names and numbers
- Applicable error messages
- Operating system type and revision level
- Detailed, specific questions

HP storage web site

The HP web site has the latest information on this product, as well as the latest drivers. Access storage at: http://www.hp.com/country/us/eng/prodserv/storage.html. From this web site, select the appropriate product or solution.

HP services

For assistance with implementing this Feature Pack for HP StorageWorks NAS and Microsoft Exchange Server 2003, HP Services has over 850 consultants specifically trained and certified on Microsoft Exchange. These experts will help you maximize the long-term value of your HP and Microsoft Exchange messaging solution.

In addition, our global team of 23,000 Microsoft-trained specialists and 5,000-plus Microsoft-certified engineers can assist you from planning and design, though implementation and integration, to ongoing technical support.

Contact your HP representative or reseller today, or visit: http://www.hp.com/solutions/microsoft/mses

HP authorized reseller

For the name of your nearest HP authorized reseller:

- In the United States, call 1-800-345-1518
- In Canada, call 1-800-263-5868
- Elsewhere, see the HP web site for locations and telephone numbers: http://www.hp.com.

Introduction

<div style="text-align: right;">**1**</div>

The Microsoft Windows Storage Server 2003 Feature Pack (Feature Pack) allows Microsoft Exchange Server 2003 databases and transaction logs to be stored on an HP StorageWorks NAS 1200s or 2000s network attached storage (NAS) device running Microsoft Windows Storage Server 2003. A single Windows Storage Server computer running the Feature Pack can host the databases and transaction logs of up to two Exchange servers and up to 1,500 Exchange mailboxes.

The Feature Pack installs new components on both the Windows Storage Server computer and Exchange Server 2003. These components provide tools and services that allow Exchange databases and transaction logs to be moved to a Windows Storage Server computer, and they perform the necessary configuration updates to give Exchange Server 2003 access to the remotely stored files.

Exchange database tools and applications that are currently being used by an organization can still be used in conjunction with the Feature Pack within the limitations of the Feature Pack. See Chapter 5, "Utilities and Applications," for detailed information.

Feature pack documentation

This deployment guide includes guidelines for deploying the Feature Pack in low-capacity (250 mailboxes), midlevel (750 mailboxes), and high-capacity (1,500 mailboxes) Windows Storage Server installations, and in Exchange Server 2003 installations of either Standard or Enterprise edition. Other topics include:

- Specific instructions for installing the Feature Pack

- Procedures for moving Exchange databases and transaction logs to the Windows Storage Server computer

- Examples of using Exchange database tools and applications with the Feature Pack

- Troubleshooting solutions to assist with common problems that might occur when using the Feature Pack

Although the Feature Pack is used in conjunction with the Exchange server and Exchange tools and applications, there is no information provided in this guide about how Exchange tools and applications work or how to use Exchange Server 2003. Additional references point to other documentation that is available to assist them in learning more about Exchange Server 2003.

Additional resources are cited that provide reference material related to the topic. For a listing of all references, see Appendix B, "Additional Resources."

Planning the Deployment

2

The Feature Pack supports a total of 1,500 Exchange mailboxes on one or two active Exchange servers connected to one Windows Storage Server computer. Supported configurations include:

■ One or two standalone Exchange servers

■ One or two active/passive two-node Exchange clusters

■ One active/passive two-node Exchange cluster and one standalone Exchange server

■ One active/active two-node Exchange cluster

To ensure that the Feature Pack deployment proceeds smoothly, it is important to carefully plan server and network configurations before beginning.

Installation overview

The installation involves the following tasks:

1. Ensure that installation requirements are met.

2. Set up and configure a dedicated network for Exchange database traffic (recommended).

3. Edit the hosts files on the Exchange server and Windows Storage Server computer to use the dedicated network.

4. Configure the disk drives on the Windows Storage Server computer.

5. Install the Feature Pack on the Windows Storage Server computer.

6. Create a Server Message Block (SMB) share for the folder on the Windows Storage Server computer containing the setup files that are required to perform the installation on the Exchange server.

7. Install the Feature Pack on the Exchange server from the SMB share on the Windows Storage Server computer.

Refer to the Feature Pack installation guide on the Service Release 1 CD for detailed installation instructions.

Installation requirements

The following requirements must be met to deploy the Feature Pack:

■ Hardware Requirements

   HP recommends at least two network adapters in each Exchange server.

   — One Gigabit adapter to support the dedicated Gigabit network

   — One adapter to connect the exchange server to the public network and to Active Directory

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Note: Following these recommendations increases the efficiency and security of the deployment.

■ Software Requirements

   — The Exchange server must be running Microsoft Windows Server 2000 Service Pack 4 (or later) or Microsoft Windows Server 2003 (or later) with Exchange Server 2003.

   — The Windows Storage Server computer must be running Microsoft Windows Storage Server 2003.

■ Windows Storage Server and the Exchange server/cluster must be in the same Active Directory Domain.

■ For Exchange clusters, the feature pack must be installed on each Exchange server that uses an HP StorageWorks NAS 1200s or 2000s to host databases and/or transaction logs.

Windows Storage Server 2003 deployment scenarios

Most deployments of Windows Storage Server 2003 follow one of these scenarios, depending on the mailbox requirements of the system:

- Low-capacity scenario (for up to 250 mailboxes)
- Medium-capacity scenario (for up to 750 mailboxes)
- High-capacity scenario (for up to 1,500 mailboxes)

The following sections describe the recommended configuration for each scenario. For both performance and security reasons in all scenarios, a dedicated Gigabit network is recommended for Exchange traffic between the Exchange server and the Windows Storage Server computer.

All three configurations allow the administrator to restore the Exchange database from the last known good backup.

Note: The Windows Storage Server computer and the Exchange servers must be in the same Active Directory.

Recommended low-capacity scenario

The low-capacity scenario supports up to 250 mailboxes on one Exchange 2003 server.

Exchange transaction logs and databases are stored on separate systems to provide efficiency so that the writing of transaction logs does not interfere with the writing of database entries.

Table 3 describes the low-capacity scenario.

Table 3: Low-capacity scenario for Exchange 2003

Configuration Component	Description
Capacity	One Exchange 2003 server and one NAS 1200s supporting as many as 250 mailboxes.
Windows Storage Server computer	One NAS 1200s storing Exchange databases on a software RAID 5 volume that spans four disk drives.
Exchange Server	Exchange server storing transaction logs
Network	One cross over network cable connects the NAS 1200s and the Exchange Server. A second network connection (not shown) allows communication between the Exchange server and clients.
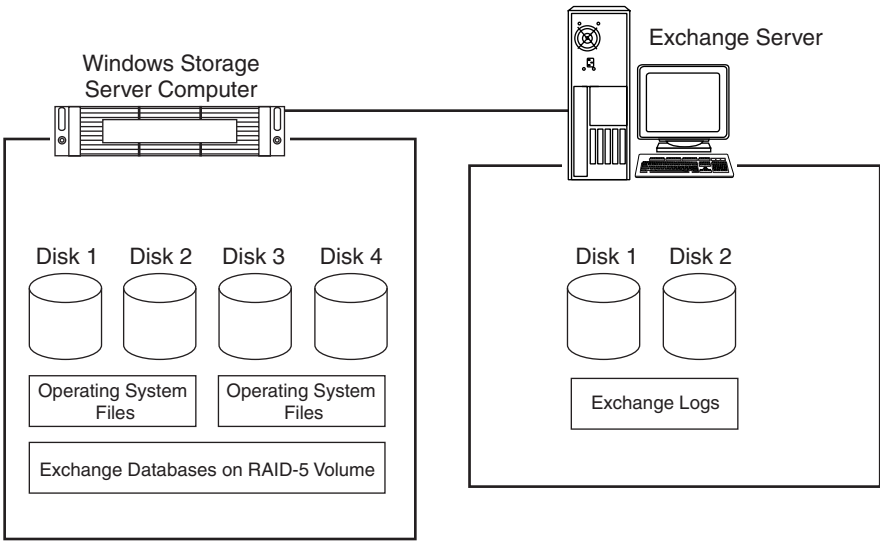
Figure 1: Low-capacity scenario

Medium-capacity scenario

The medium-capacity scenario supports up to 750 mailboxes on one Exchange 2003 server.

Exchange transaction logs and databases are stored on separate volumes to provide efficiency so that the writing of transaction logs does not interfere with the writing of database entries.

Table 4 describes the medium-capacity scenario.

Table 4: Medium-capacity scenario for Exchange 2003

Configuration Component	Description
Capacity	One Exchange 2003 server and one NAS 2000s supporting as many as 750 mailboxes.
Windows Storage Server computer	One NAS 2000s stores Exchange Databases on a RAID 5 volume and stores the Exchange transaction logs on a RAID 1 volume.
Exchange server	Exchange server.
Network	A dedicated 1 Gigabit Ethernet Network is used to connect the NAS 2000s to the Exchange Server. A second network connection (not shown) allows communication between the Exchange server and clients.
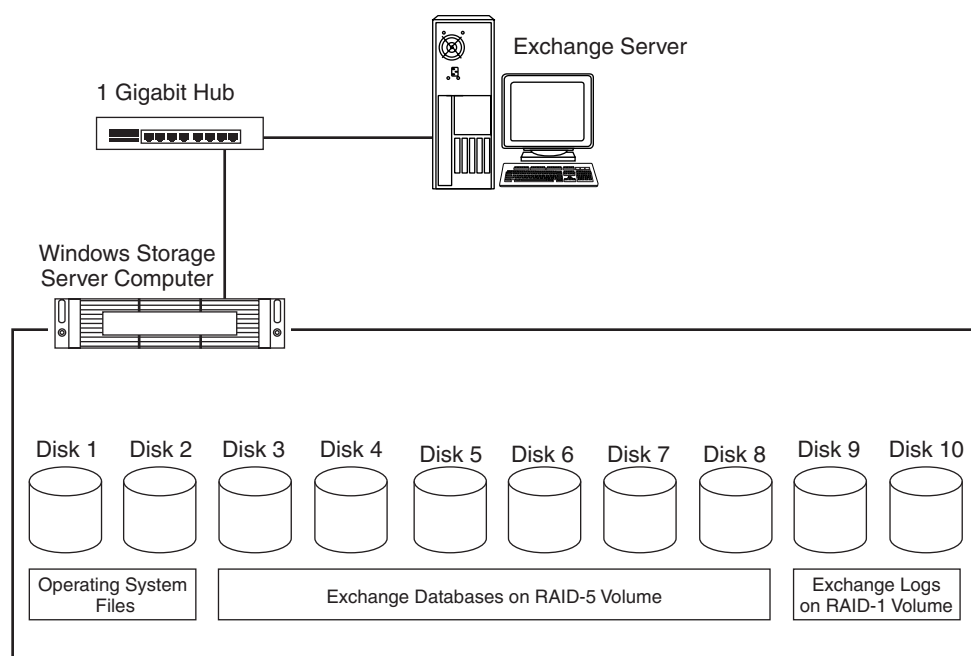
Figure 2: Medium-capacity scenario

High-capacity scenario

The high-capacity scenario supports up to a total of 1,500 mailboxes on one or two Exchange 2003 servers.

Exchange transaction logs and databases are stored on separate volumes to provide efficiency so that the writing of transaction logs does not interfere with the writing of database entries.

If two Exchange servers are used, each transaction log should be on a separate volume.

Table 5 describes the high-capacity scenario.

Table 5: High-capacity scenario for Exchange 2003

Configuration Component	Description
Capacity	One or two Exchange 2003 server and one NAS 2000s supporting a total of 1500 mailboxes.
Windows Storage Server computer	One NAS 2000s with MSA30 stores Exchange Databases on a RAID 5 volume and stores the Exchange transaction logs on a RAID 1 volume.
Exchange Server	Exchange server.
Network	A dedicated 1 Gigabit Ethernet Network is used to connect the NAS 2000s to the Exchange Server(s). A second network connection (not shown) allows communication between the Exchange server and clients.
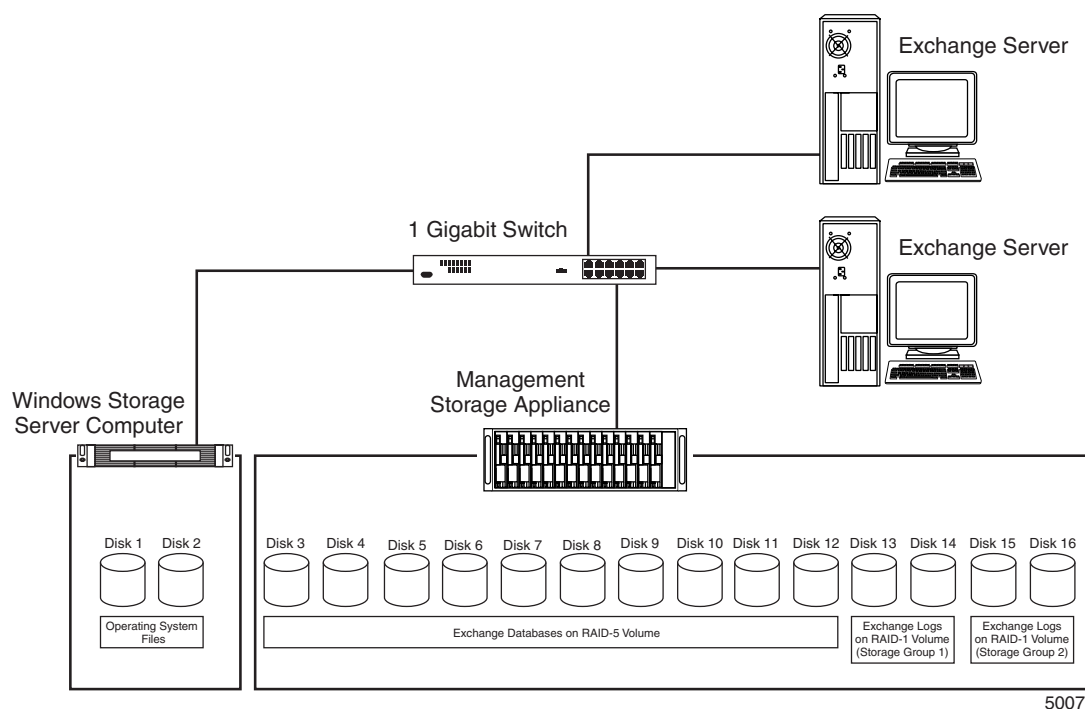
Figure 3: High-capacity scenario

Planning deployment of the Feature Pack on Exchange servers

Deploying the Feature Pack on Exchange Server 2003 involves deploying the Exchange Server 2003 computer and then moving the Exchange database (Exchange stores and transaction logs) to the Windows Storage Server computer. The Exchange server deployed can be a new Exchange Server 2003 computer, an existing Exchange Server 2003 computer, or an upgrade from Exchange 2000 Server to Exchange Server 2003.

After the Exchange server is deployed, the administrator can move an existing Exchange database or create a new Exchange database to move to the Windows Storage Server computer.

Advantages of moving an existing Exchange database include:

■ Involves less labor for the administrator; the remote storage tools included in the Feature Pack perform all required steps automatically.

■ Results in less overall down time.

Advantages of creating a new Exchange database include:

■ Improves Exchange server performance; a new database uses disk space more efficiently than a database that has been in use for some time.

■ Allows for testing the deployment with a small subset of users.

■ Results in less down time per user; each mailbox remains offline for only the time it takes to move that mailbox.

Security planning

Moving Exchange databases and transaction logs to a Windows Storage Server computer requires the Exchange server to access its data over a network connection. It is important to verify the security of that connection. A dedicated Gigabit network for Exchange traffic is strongly recommended to help prevent network sniffing of Exchange data.

Additionally, the Server Message Block (SMB) share used to host the Exchange databases and transaction logs on the Windows Storage Server computer must be locked down to ensure data security. Limiting access to this share to the minimum number of administrators, backup operators, and Exchange servers required is strongly recommended.

Note: SMB shares created using the Win32 user interface grant Read permissions to the Everyone group by default. This permission setting must be removed on shares used to host the Exchange databases and transaction logs to ensure data security.

For additional information about Exchange server security requirements, see "Planning an Exchange Server 2003 Messaging System:" http://go.microsoft.com/fwlink/?LinkId=23131.

Installation Considerations

3

The installation involves the following tasks:

1. Ensure that installation requirements are met.

2. Set up and configure a dedicated network for Exchange database traffic (recommended).

3. Edit the hosts files on the Exchange server and Windows Storage Server computer to use the dedicated network.

4. Configure the disk drives on the Windows Storage Server computer.

5. Install the Feature Pack on the Windows Storage Server computer.

6. Create a Server Message Block (SMB) share for the folder on the Windows Storage Server computer containing the setup files that are required to perform the installation on the Exchange server.

7. Install the Feature Pack on the Exchange server from the SMB share on the Windows Storage Server computer.

Refer to the Feature Pack installation guide on the Service Release 1 CD for detailed installation instructions.

Components installed with the Feature Pack

Windows Storage Server

■ Adds a New Share for Exchange Files task to the Microsoft Web User Interface for Windows Storage Server Administration (WebUI). The new task allows an administrator to easily create and manage the shares that host Exchange databases and transaction logs. For information about using the New Share for Exchange Files task, see Chapter 4, "Moving Exchange files to a Windows Storage Server computer."

■ Creates a folder on the Windows Storage Server computer that contains the setup and installation files that the customer will use to install the Feature Pack on the Exchange server.

■ Installs a copy of the Windows Storage Server 2003 Feature Pack Installation Guide, located on the system drive in *%ProgramFiles%\Windows Storage Server\Exchange\Installation_Guide.doc*.

Exchange server

■ The Remote Storage Wizard moves the databases and transaction logs for an Exchange storage group to a Windows Storage Server computer and performs the configuration updates that are required for Exchange to access the files.

■ The WSSExchMove.exe command-line tool offers the same capabilities as the Remote Storage Wizard, as well as a few additional features, such as the ability to script an unattended move and to copy the Exchange files to their destination locations without deleting the original files.

■ The Windows Storage Server Mapping Service (WSSExchMapSvc):

— Creates a mapped drive during the initial installation for use with Exchange shares that are stored on Windows Storage Server computers.

— Verifies the existence of the DFS root, DFS links, and share access after each restart of the Exchange server and every time Windows Storage Server Mapping Service is started.

— Recreates the mapped drive, if required, after the Exchange server or the Windows Storage Server Mapping Service is restarted. The service starts automatically whenever the Exchange server is restarted. This allows the administrator to stop and restart the Exchange server without manually locating and starting the Windows Storage Server Mapping Service. The verification process and mapped drive creation process run to completion as soon as the service starts. The service shuts down five minutes after these processes complete.

■ The documentation that is installed includes:

— *Windows Storage Server 2003 Feature Pack Installation Guide*, located on the system drive in *%ProgramFiles%\Windows Storage Server\Exchange\Installation_Guide.doc*.

— Help for Remote Storage Tools for Exchange, located on the system drive in *%ProgramFiles%\Windows Storage Server\Exchange\RemoteStorageTools.chm*.

Deploying the Feature Pack with Exchange Server 2003

To deploy the Feature Pack with Exchange Server 2003:

1. Deploy the Exchange Server 2003 computer.

   ■ **If a new Exchange Server 2003 computer is being deployed**: Perform the Exchange Server 2003 installation on the target computer.

   ■ **If an existing Exchange Server 2003 computer is being deployed**: Perform a full backup of the Exchange database to minimize the size of transaction logs.

   ■ **If an upgrade from Exchange 2000 Server is being deployed**: Perform a full backup of the Exchange database, then perform the upgrade from Exchange 2000 Server to Exchange Server 2003 on the target computer.

2. Move the Exchange database to the Windows Storage Server computer by following these steps:

   ■ If an existing Exchange database is being moved:

   — Using either of the remote storage tools included in the Feature Pack, move the existing Exchange database (Exchange stores and transaction logs) to the Windows Storage Server computer.

   ■ If a new Exchange database is being created:

   — Using Exchange System Manager, create a new database on the Exchange server.

— Using either of the remote storage tools included in the Feature Pack, move the new Exchange database to the Windows Storage Server computer.

— Using Exchange System Manager, move existing Exchange stores and transaction logs to the new Exchange database on the Windows Storage Server 2003 computer.

For complete instructions for moving the Exchange database, see Chapter 4, "Setup and Configuration."

Drive mapping on the Exchange server

The Feature Pack works with Exchange tools and services to enable the Exchange server to access remotely stored databases and transaction logs on the Windows Storage Server computer. The Distributed File System (DFS) sets up and provides access to the paths for remotely stored files and folders.

Using a standalone DFS for local drive mapping

DFS is a service of Microsoft Windows Storage Server 2003 and Microsoft Windows 2000 Server that makes it easier to manage distributed resources. The DFS service provides the consolidated drive mapping and links that are required to access remotely stored Exchange databases and transaction logs on a Windows Storage Server computer.

The Exchange server accepts only mapped drives as valid paths for remote locations. Exchange cannot find databases and transaction logs that are stored in shared folders on the Windows Storage Server computer unless the shared folders are mapped to a local drive. To provide a manageable solution, the Feature Pack consolidates all drive mappings for Exchange shares that are hosted on Windows Storage Server computers into a single, standalone DFS root on the local Exchange server. The drive letter is mapped to the DFS root, and the links for all Exchange shares are created under the DFS root. The standalone DFS keeps configuration information in the local registry of the host server.

When the Feature Pack is installed on the Exchange server, a mapped drive is created, which maps to the standalone DFS root. By default, the S: drive is used. If that drive letter is already in use, the next available drive letter is assigned.

The DFS root is named based on the mapped drive letter. If the S: drive is used, the DFS root is named S$. The folder for the DFS root is located in *%ProgramFiles%\Windows Storage Server\Exchange*.

Table 6 explains how network addresses for a remotely stored Exchange file are mapped to a local drive on the Exchange server by different services on the Exchange server. For a full discussion of how link names and link targets relate to the current location and Active Directory location of remotely stored Exchange database files and transaction logs, see Appendix A, "Detailed Report Log Files."

Table 6: Drive mapping for the {StorageServer.0} DFS link

Address	Explanation of Address
S:\{StorageServer.0}\	A mapped drive representation of the UNC path. This is the address that is stored in Active Directory and used by the Exchange Information Store Service where: ■ S: is a mapped drive that is mapped to \\Exchange Server\S$
\\ExchangeServer\S$\{Storage Server.0}\	Windows Storage Server Drive Mapping Service expands the mapped drive path, where: ■ ExchangeServer is the name of the Exchange server. ■ S$ is the target of the mapped drive S:, which is also the name of the standalone DFS root. ■ {StorageServer.0} is the link name. The link associates a link name with a link target, which identifies the UNC path to the remote share that the link represents.
\\StorageServer\Share1	DFS replaces the expanded mapped drive path with the UNC path.

Figure 4 shows how a path stored in the Windows Storage Server 2003 Active Directory directory service and used by the Exchange Information Store service is mapped to a UNC path for a shared folder on the Windows Storage Server computer.
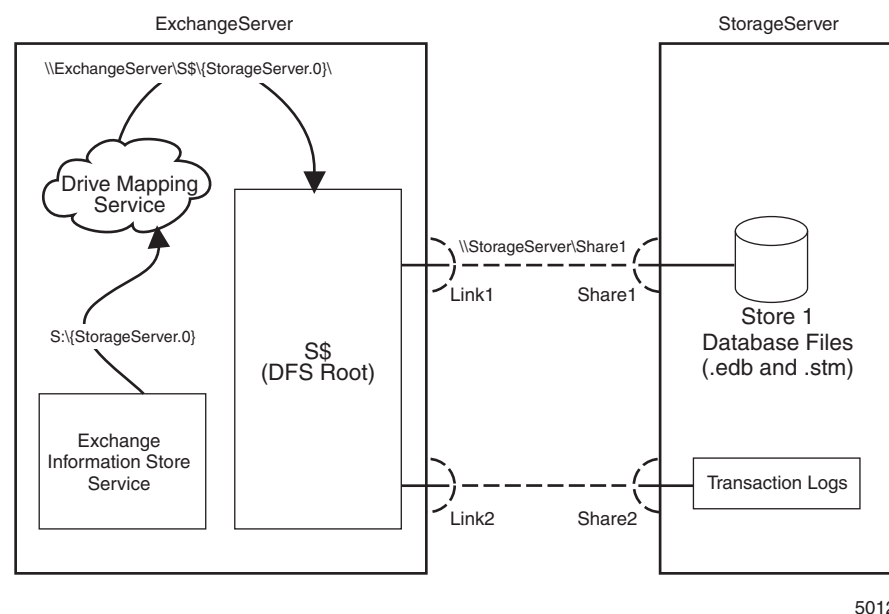
Figure 4: Mapping the network address for a remotely stored Exchange file to a local drive on the Exchange server

On the local Exchange server, Windows Storage Server Mapping Service ensures that the required drive mapping exists to allow Exchange to locate the remotely stored databases and transaction logs. When the Exchange server is started, Windows Storage Server Mapping Service verifies that the DFS root exists, that there is a DFS link for each share, and that there is access to the shares. If necessary, Windows Storage Server Mapping Service recreates the mapped drive.

Note: If the Exchange Server is installed on Windows 2000 Server or Windows Storage Server 2003 Standard Edition, only one local DFS root is allowed. If a DFS root was previously created, a DFS root cannot be created for the Feature Pack and the installation will not complete successfully.

DFS configuration for an Exchange cluster

The Feature Pack must be installed on each server in an Exchange server cluster.

Each cluster node has a separate mapped drive and DFS root. When the Feature Pack is installed on an Exchange server that is clustered, the DFS root and mapped drive are created and the DFS information is stored in the Cluster key of the registry. The DFS root and registry information is then replicated between cluster nodes so that both nodes use the same configuration. When the Feature Pack is installed on the second node of the Exchange cluster, the DFS root and registry information already exist and do not need to be recreated.

Note: The Feature Pack does not support Windows Storage Server clusters.

For more information about using the Feature Pack with Exchange server clusters, see Chapter 2, "Planning the Deployment."

Installing patches

Refer to the installation guide on the Service Release 1 CD for installation information.

If you need to install patches on the NAS 1200s or 2000s:

■   Always shut down the Exchange Information Store service before applying any patches. This ensures that the databases are not in use if the Exchange server must be restarted.

■   If multiple patches are released together, install them in the following order:

1.   On the Windows Storage Server 2003 computer.

2.   On the operating system on which Exchange Server 2003 is installed.

3.   On Exchange Server 2003.

■   If any server must be restarted, start the Windows Storage Server 2003 computer first, then start the Exchange 2003 server. This will ensure that any Exchange databases or transaction logs that are stored on the Windows Storage Server are available when Exchange Server 2003 starts.

Shutdown order for the Exchange and Windows Storage Server computers

If you need to shut down the Exchange server for maintenance and you have Exchange databases and transaction logs stored on a Windows Storage Server computer, use the following shutdown order to restart one or both of the servers:

■   To restart either the Exchange server or the Windows Storage Server computer, always shut down the Exchange Information Store service on the Exchange server before shutting down the server.

■   To restart both servers, restart the Windows Storage Server computer first and then the Exchange server. This ensures that any storage groups that are hosted by the Windows Storage Server computer are available when Exchange Server 2003 starts.

Uninstalling Windows Storage Server 2003 Feature Pack

The Windows Storage Server 2003 Feature Pack Uninstaller removes all components of the Feature Pack that have been installed on the server. On the Exchange server, the uninstaller also removes the DFS configuration from the registry.

To start the uninstaller, in Control Panel, double-click Add/Remove Programs, and then click Windows Storage Server 2003 Feature Pack.

Because the uninstaller removes all DFS configuration information, the DFS links cannot be automatically recreated when Windows Storage Server Mapping Service is started after a reinstallation of the Feature Pack. Exchange databases and transaction logs that were transferred from the Exchange server to the Windows Storage Server computer should be returned to the Exchange server before the Feature Pack is uninstalled.

> **Caution:** Uninstalling Feature Pack components while Exchange databases and transaction logs are on a Windows Storage Server computer will cause those databases and transaction logs to be inaccessible from Exchange, and can result in database loss or corruption.

On either server, the uninstaller checks for remotely stored Exchange files before uninstalling Feature Pack components and issues a warning message if Exchange files are stored on a Windows Storage Server computer.

If the Feature Pack is being uninstalled on the Exchange server, the uninstaller checks for Exchange databases or transaction logs from the Exchange server that are currently stored on a Windows Storage Server computer.

> **Note:** If Exchange databases and transaction logs remain on the Windows Storage Server computer after the Feature Pack is uninstalled, these databases and logs cannot be accessed because the uninstall operation deletes the DFS configuration. To resolve this situation, the Feature Pack can be reinstalled after the DFS configuration is recreated. For more information about recovering DFS configuration information and reinstalling the Feature Pack, see Chapter 6, "Troubleshooting."

Feature Pack components can be uninstalled in unattended mode from a command prompt, or in attended mode using the Setup wizard.

Command-line method

To uninstall Feature Pack components from a command prompt (unattended mode):

1. Insert the CD into the CD-ROM drive. Alternatively, you can uninstall from a network folder.

2. At the command prompt, type the following: `[path\]Setup.exe /x /qn` where:

   - path is the fully qualified path of the *Setup.exe* file
   - /x is the parameter for uninstalling a product
   - /qn allows the installation to run without user intervention

   If the *Setup.exe* file is in the current folder, you can omit the path.

> **Note:** The *Setup.exe* program uses the same arguments as Windows Installer (*Msiexec.exe*). All Windows Installer arguments can be used when running *Setup.exe* from the command line. For more information about Windows Installer arguments, see "Command Line Options" in the Windows Installer documentation in the Platform Software Development Kit (PSDK) at the Microsoft web site (http://msdn.microsoft.com).

3. Repeat this process on the Exchange server (or on all clustered Exchange servers), and on the Windows Storage Server computer.

Setup wizard method

To uninstall Feature Pack components using the Setup wizard (attended mode):

1. In the Control Panel, double-click **Add or Remove Programs**.

2. Click Windows Storage Server 2003 Feature Pack, and then click **Uninstall**.

3. Repeat this process on the Exchange server (or on all clustered Exchange servers) and on the Windows Storage Server computer.

Setup and Configuration

4

Moving Exchange files to a Windows Storage Server computer

To move the databases and transaction logs for an Exchange storage group to a Windows Storage Server computer, you must use a remote storage tool. If you move files without using a remote storage tool, Exchange Server 2003 cannot access the remotely stored files.

The Feature Pack provides two remote storage tools:

- Remote Storage Wizard
- WSSExchMove.exe command-line tool

The remote storage tools are used to move the databases and transaction logs for an existing Exchange storage group to existing shared folders hosted on a Windows Storage Server computer.

There is no way to specify a remote destination location when you create a new database in Exchange. You must first create a database locally and then move the database to the remote location by using one of the remote storage tools.

The remote storage tools also do not create and share the folders on the destination server. Before moving Exchange files, you must create the shares and assign the required permissions.

Note: Moving a storage group to a remote location requires that Exchange access the databases and transaction logs over a network connection. Before moving a storage group, verify that your network is configured correctly. For configuration recommendations when deploying Windows Storage Server 2003 Feature Pack, see Chapter 2, "Planning the Deployment."

Guidelines for moving files

When moving databases and transaction logs to a Windows Storage Server computer, use the following guidelines:

- You must create the Exchange storage group and all of its stores on the local Exchange server before moving the storage group. For information about creating storage groups in Exchange 2003, see Help for Exchange System Manager.
- To minimize service interruptions from the Exchange databases, schedule the move outside normal business hours, when e-mail traffic is low. Moving an Exchange database requires dismounting the store and then remounting it after the files are moved. Depending upon the size of files being moved, this might require a significant amount of time.

■ To script a move, use WSSExchMove.exe. The script must be run locally on the Exchange server. Only one instance of WSSExchMove.exe should be run at a time on the Exchange server.

■ When you perform a configuration update, it is important to finish copying the files before you attempt to remount the Exchange stores. Mounting the Exchange stores before all existing transaction logs have been moved invalidates previous backups. If the database is remounted before the transaction logs are moved, the Restore utility will only be able to restore the database through the time of the last backup. It is recommended that you perform a full backup immediately after successfully mounting the Exchange stores.

■ When performing a full move or configuration update for an Exchange cluster, all nodes in the cluster must be online. Otherwise, the move will not proceed.

■ To move a Recovery Storage Group to a Windows Storage Server computer, you must create the Recovery Storage Group on the Exchange server and then use a remote storage tool to move the storage group before mounting its stores or performing any restore operations. For additional information, see Chapter 5 "Utilities and Applications."

> **Caution:** Before uninstalling the Feature Pack, it is important that you move all Exchange databases and transaction logs that are currently stored on the Windows Storage Server computer back to the local Exchange server. Uninstalling the Feature Pack components while Exchange databases and transaction logs are on a Windows Storage Server computer renders the files inaccessible from Exchange, and can result in database loss or corruption.

Two types of moves

The Remote Storage Wizard and the WSSExchMove.exe command-line tool support two types of moves: a full move or a configuration update. The key distinctions between these two types of move are the physical locations of the files after the move and the prerequisites that must be met to successfully complete the move.

Table 7: Summary of move types

Type of Move	Description	Requirements and Considerations	How the Move is Processed
Full	All physical files are transferred and the required configurations are updated. This method validates the existence of the physical files before the move.	All stores that are being moved must be dismounted. This includes stores for Exchange databases and transaction logs. If the physical file is not found, the move will fail.	1. Dismount any mounted stores that are being moved. If transaction logs for the storage group are being moved, all stores are dismounted. 2. Verify that the stores have been dismounted cleanly and are consistent. 3. Copy the files to their destination locations, assigning read-only access to the source files. 4. Updates Active Directory with the new file locations. 5. On the local Exchange server, creates a DFS link for each of the database (.edb) files and streaming database (.stm) files that was moved, and a link for the transaction logs if they were moved. The tool then updates the Windows registry with the DFS links and link targets. 6. Mounts each store that was dismounted. 7. Deletes the files that were copied from their original locations. (See Note below.)
Configuration Update	Only configuration updates are performed with this method. No validation of physical files is made and no physical files are transferred. During the move, the stores are dismounted.	Configuration updates can potentially be made on stores that are non-existent or are not available for moves. After a successful update, the administrator must remount the Exchange stores.	1. Dismounts any mounted stores that will be moved. If the transaction logs for the storage group are being moved, the remote storage tool dismounts all stores of the storage group. 2. Updates Active Directory with the specified destination locations. 3. On the local Exchange server, creates a DFS link for each of the database (.edb) files and streaming database (.stm) files that was moved, and a link for the transaction logs if they were moved. The tool then updates the registry with the DFS links and link targets.

Note: When using WSSExchMove.exe, Step 7 is optional. The /n parameter copies the files to the destination location without deleting the source files. For additional syntax information for WSSExchMove.exe, see Help for Remote Storage Tools for Exchange, located on the Exchange server in *%ProgramFiles%\Windows Storage Server\Exchange\RemoteStorage.chm*. The Exchange administrator who performs the move, and the Exchange server that contains the files that the Windows Storage Server computer will host must have Full Control permission for the destination share and also for the underlying shared folder. If the required permissions have not been assigned, the move fails.

Further information regarding the move process

Mapping Exchange shares to a local drive

During a full move or a configuration update, a DFS link is created for each database (.edb) file and streaming database (.stm) file that is moved. If transaction logs are moved, a single DFS link is created for all log files. The link names have the format {servername.n}, where servername is the name of the Windows Storage Server computer that hosts the files and n is a sequentially assigned number that uniquely identifies the link on the host computer. The curly brackets ({ }) are included in the name. The link target is the UNC address. The address that is stored in Active Directory is the address that is mapped to the local drive letter being used for Exchange shares.

For more information about how the DFS links are created and mapped for use by Exchange Server 2003, see Chapter 3, "Installation Considerations." For a full discussion of how link names and link targets relate to the current location and Active Directory (AD) location of remotely stored Exchange database files and transaction logs, see Appendix A, "Interpreting the Detailed Report Log File."

Processing a configuration update

Because the remote storage tool does not check for the existence of the source files or the state of the database during a configuration update, the configuration update can complete successfully, even if the files no longer exist or are no longer accessible.

As in the full move, the remote storage tool dismounts any mounted stores involved in the move. However, the tool does not physically move the files; nor does it attempt to remount any stores that were dismounted after updating the configuration. To restore access from the Exchange database, the Exchange administrator must physically move the files to the destination locations that were configured and then remount any stores that were dismounted.

⚠ **Caution:** After you perform a configuration update, it is important to finish copying the files to their destination locations before attempting to mount the Exchange stores. Mounting the Exchange stores before all of the existing transaction logs have been moved will invalidate previous backups. It is recommended that you perform a full backup of Exchange immediately after successfully mounting the storage groups.

A configuration update can succeed even if the databases that are involved have not been shut down correctly. Moving databases that have not been shut down correctly will prevent the automated recovery of those databases by the Microsoft Exchange Information Store service.

Processing a move for an Exchange cluster

If the Windows Storage Server computer stores databases and transaction logs for an Exchange server cluster, each move is performed on the virtual server that owns the Exchange server, which currently owns the Exchange storage group. When you move a storage group for an Exchange cluster, all nodes in the cluster must be online; otherwise, the move will not begin.

Each node in the cluster has its own standalone DFS root, which is used for Exchange files that are hosted on Windows Storage Server computers. However, the DFS root is mapped to the same drive letter on all of the servers so that the DFS links for Exchange storage groups on all of the servers have the same local drive mapping.

The registry entries for DFS links are stored in the Cluster key, which is replicated on all servers in the cluster. All Exchange servers in the cluster store the configuration of all remotely stored Exchange storage groups on all servers.

Note: For information about the Exchange cluster configurations that Windows Storage Server 2003 Feature Pack supports, see Chapter 2, "Planning the Deployment." For information about how the DFS configurations are replicated within an Exchange cluster when the Feature Pack is installed, see Chapter 3, "Installation Considerations."

Preparing to move the files

The remote storage tools for Exchange are used to move the databases and transaction logs for an existing Exchange storage group to existing shared folders on the destination Windows Storage Server computer.

For this reason, moving Exchange files to a Windows Storage Server computer involves two steps:

1. On the Windows Storage Server computer, create shared folders to store the Exchange databases and transaction logs.

2. Use the Remote Storage Wizard or WSSExchMove.exe to move the Exchange transaction logs and databases to the destination folders.

After completing a move, you can view the configuration of the storage groups on the local Exchange server by displaying a Detailed Report.

Creating shares to host the Exchange files

Before using a remote storage tool to move Exchange databases and transaction logs, you must create and share the folders that will store them on the Windows Storage Server computer.

Guidelines for creating shares

When creating shares to host Exchange databases and transaction logs, the following guidelines apply:

■ With the Feature Pack installed, a Windows Storage Server computer supports as many as four storage groups from as many as two Exchange servers. If the Exchange servers are clustered, the Windows Storage Server computer supports storage groups from two virtual Exchange servers. For information about the Exchange cluster configurations that the Feature Pack supports, see Chapter 2, "Planning the Deployment."

■ On the Windows Storage Server computer, the database files for any Exchange store will always be moved to the same designated share. These include the database (.edb) file and the streaming database (.stm) file.

■ To optimize performance and allow for complete restore operations with minimal mail loss, it is recommended that you store database files on a separate volume from the transaction logs. For guidance in deciding where to locate the shared folders that host the databases and transaction logs on the Windows Storage Server computer, see Chapter 2, "Planning the Deployment."

■ You can create a share either by using the New Share for Exchange Files task in the Microsoft Windows Storage Server Administration Web user interface (WebUI) or by using Windows Explorer in Windows Storage Server 2003 to share a folder.

> **Note:** For help in troubleshooting problems with creating shares for Exchange files, see Chapter 6, "Troubleshooting."

Using the administration WebUI to create an Exchange share

You can use the New Share for Exchange Files task in the Administration WebUI to create a share that is configured to host stores or transaction logs for an Exchange storage group. The Exchange share is configured to use the Server Message Block (SMB) protocol. As you create the share, you can automatically assign the permissions needed to give Exchange access to the files by listing the user and computer accounts that require access. Each account that you list is assigned Full Control permission for both the share and the shared folder. All other users, groups, and computers are denied access to the share.

The following accounts must have access to the Exchange share and the underlying folder:

■ The domain user account for the Exchange administrator who will move Exchange transaction logs and databases to the Windows Storage Server computer. In addition, list any users who would require access to the share if it were on Direct Attached Storage (DAS) or a Storage Area Network (SAN) - for example, backup operators.

■ The computer account for the Exchange server. For an Exchange cluster, each server in the cluster must have access.

> **Note:** To create a share using the WebUI, a user must be logged on to the Windows Storage Server computer under a domain account with administrative rights on the computer.

To add an Exchange share by using the WebUI:

1. Log on to the Web UI on the Windows Storage Server computer by opening https://servername:portnumber, where:

   ■ servername is the name of the Windows Storage Server computer that will host the Exchange files.

   ■ portnumber identifies the port that is in use. (The default port is number 8098.)

2. On the primary navigation bar, click **Shares**.

3. On the Shares page, click **Shares**.

4. In the Tasks list, click **New Exchange**.

5. To set up the share, enter the share name, share path, and an optional comment.

> **Note:** Both the share name and share path are restricted to ASCII (single-byte) characters. The following ASCII characters cannot be used in the share name: \ / : * ? " < > | . The same restrictions apply to the path, with the exception of the backslash (\ ).

6. To provide access to the share:

   a. Add each Exchange administrator who will need access to the share to the list of user and group accounts.

   b. Add each Exchange server that must access the share to the list of computer accounts. For an Exchange cluster, add each node in the cluster. Adding an account to the list assigns Full Control permission to both the share and the shared folder.

For detailed instructions that tell how to create a share for Exchange files by using the WebUI, see Help for the WebUI.

Sharing a folder by using Windows Explorer

If you prefer to use Windows Explorer to share a folder to host Exchange databases and transaction logs, create an SMB share. Assign the required Full Control permissions for the share, then assign the same permissions for the underlying folder. If you create a share by using Windows Explorer, its properties can only be updated by using Windows Explorer. For information about sharing resources in Windows Explorer, see Help and Support Center for Microsoft Windows Storage Server 2003. You can use Windows Explorer to assign permissions to a share and folder that you have created for Exchange by using the WebUI. However, the Web UI only supports Full Control permissions. If you update share properties in the WebUI, only Full Control permissions are supported and displayed; when you save the updated properties for the Exchange share, the displayed permissions replace all other permissions assigned to the share and to the underlying folder.

Moving the files

After creating SMB shares to host the Exchange files on the destination Windows Storage Server computer and assigning the required permissions, use one of the two remote storage tools for Exchange—either the Remote Storage Wizard or the WSSExchMove.exe command-line tool—to move the files.

Both tools must be run locally on the Exchange server. The Remote Storage Wizard is run from Exchange System Manager by choosing the Remote Storage Manager task for the current Exchange storage group. WSSExchMove.exe can be run from any command prompt on the Exchange server and can be used to perform a scripted move. For a full comparison of the tools, see "Choosing a remote storage tool," in the next section.

This section presents basic procedures used to move databases and transaction logs from an Exchange storage group to a Windows Storage Server computer. For a full description of the features of each tool and the methods for using them, see Help for Remote Storage Tools for Exchange, in *%ProgramFiles%\Windows Storage Server\Exchange\RemoteStorage.chm* on the Exchange server. For help in troubleshooting problems with the remote storage tools, see Chapter 6, "Troubleshooting."

Choosing a remote storage tool

You can use either the Remote Storage Wizard or WSSExchMove.exe to move Exchange databases and transaction logs to a Windows Storage Server computer. There are some differences, however, between the two remote storage tools.

- The Remote Storage Wizard guides you through configuring the current Exchange storage group to store its databases and transaction logs on a Windows Storage Server computer and, optionally, moves the files to the shared folders.

- The WSSExchMove.exe command-line tool offers the same capabilities as the Remote Storage Wizard. In addition, the tool can be used to:

  — Script an unattended move

  — Copy the Exchange files to their destination locations without deleting the original files

— Map a different drive on the local Exchange server for use by Exchange

— View the current configuration of Exchange storage groups on the local Exchange server

Both remote storage tools must be run from the local Exchange server.

Table 8 compares the features available with the two tools.

Table 8: Comparison of the features of the Remote Storage Wizard and WSSExchMove.exe

	Tool	
Remote Storage Task	**Remote Storage Wizard**	**WSSExchMove.exe**
Perform a full move of Exchange databases and transaction logs, deleting the files from their original locations.	X	X
Perform a configuration update without moving the physical files.	X	X
Perform a full move without deleting the original files.		X
View the current configuration and status of storage groups on the local Exchange server. For a clustered Exchange server, view the configuration of all storage groups on all virtual servers in the cluster. [1]		X
Perform an unattended full move or configuration update by using a script.		X
Change the drive letter used for shares that host Exchange databases and transaction logs on Windows Storage Server computers.		X

[1] The Remote Storage Wizard includes an option for displaying the Detailed Report log file when the wizard completes. However, you cannot display a Detailed Report with the current configuration unless you initiate a full move or configuration update.

For detailed instructions on how to use either remote storage tool, see Help for Remote Storage Tools for Exchange, located on the Exchange server in *%ProgramFiles%\Windows Storage Server\Exchange\RemoteStorage.chm*.

Moving files by using the Remote Storage Wizard

Use the Remote Storage Wizard to move transaction logs and databases for the current Exchange storage group to a Windows Storage Server computer.

Note: To use the Remote Storage Wizard, you must be logged on to the local Exchange server under a domain account with administrative rights on the Exchange server.

To move files for an Exchange storage group using the Remote Storage Wizard:

1. On the Exchange server, start Exchange System Manager: Click **Start > Programs > Microsoft Exchange**, and then click **System Manager**.

2. Open the Server container in the console tree.

3. Click the storage group that contains the databases and transaction logs you want to move, point to **All Tasks**, and click **Remote Storage Manager**.

4. Complete the Remote Storage Wizard by using the information in the following table.

For a full description of how to use each wizard page, click **Help** on the wizard page.

Table 9: Remote Storage Wizard task summary

Task	Action
Storage Destination	Specify either the Windows Storage Server computer or the Exchange server as the storage destination for the Exchange files.
Type of Move	To specify the type of move, choose either Full transfer (to update the configuration and move the physical files) or Configuration update (to update the configuration without moving the files).
Server Selection	If you are moving files to a Windows Storage Server computer, enter the computer name of the destination Windows Storage Server computer. This page is not displayed if you are moving files back to the local Exchange server.
File Location Selection	Specify which folders to move the databases and transaction logs for this storage group to. If you are moving files to a Windows Storage Server computer, the folders must be shared on the Windows Storage Server computer, and the current user and the Exchange server must have access to the shares.
	To specify the destination location for a storage group component:
	1. In the components list for the storage group, click the component that you want to move (either transaction logs or a store), and then click Change Path.
	Note: If the database (.edb) and streaming database (.stm) files for a store are currently stored in different folders, the Current Path of the store displays the location of the .edb file. However, both files will be moved to the destination folder that you select for the store.
	2. In the Browse for Folder dialog box, click the folder that you want to move the files to, and click **OK**.
	Note: If you are moving files to a Windows Storage Server computer, and the Browse for Folder dialog box does not list the shared folder that you want to move the files to, make sure that the share exists on the Windows Storage Server computer and that Full Control permission for both the share and the underlying folder has been assigned to you and to the computer account for the Exchange server.

Moving files by using WSSExchMove.exe

When the Windows Storage Server 2003 Feature Pack is installed on the Exchange server, *WSSExchMove.exe* is installed in the *%Program Files%\Windows Storage Server\Exchange* folder. WSSExchMove.exe is added to the system path at installation and can be run from any command prompt on the Exchange server.

Note: To use either of the remote storage tools, you must be logged on to the local Exchange server under a domain account with administrative rights on the Exchange server.

To move files for an Exchange storage group by using WSSExchMove.exe:

From any command prompt on the Exchange server, type:

```
wssexchmove server storagegroup [/l location] [/s store location] ... ]]
```

Table 10 describes each parameter that is used to perform a full move of databases (stores) and transaction logs. By default, the source files are deleted after the move.

Table 10: WSSExchMove.exe parameters used to move Exchange files

Parameter	Description
server	Specifies the name of the Exchange server that owns the Exchange databases and transaction logs that are to be moved. This is the local Exchange server unless the Exchange server is clustered. For an Exchange cluster, enter the name of the virtual server.
	Note: When moving a storage group for an Exchange cluster, all servers in the cluster must be online.
storagegroup	Specifies the storage group for which transaction logs and/or database files are to be moved.
/l location	Specifies the destination location for the transaction logs for the storage group.
	If the destination is on a Windows Storage Server computer, location is the UNC path of the destination share. If the destination is the local Exchange server, enter the full path to the destination folder.
/s store location	/s store location specifies the destination location for a store from the storage group.
	If the destination is on a Windows Storage Server computer, enter the UNC path of the destination share. If the destination is the local Exchange server, enter the full path to the destination folder.
	The same share will host both the database (.edb) file and the streaming database (.stm) file for a store.
	You can move multiple stores by using a single command.

For syntax examples and information about the additional options that WSSExchMove.exe provides, see Help for the Remote Storage Tools, on the Exchange server in *%ProgramFiles%\Windows Storage Server\Exchange\RemoteStorage.chm*.

> △ **Caution:** Only one instance of WSSExchMove.exe should be run on an Exchange server at any time. For a cluster of Exchange servers, run only one instance of WSSExchMove.exe on the virtual server at any time.

Verifying a successful move

When a remote storage tool for Exchange is used, a detailed log file is saved. This file contains the current configuration of storage groups on the Exchange server and the status of the shares currently hosting Exchange files on Windows Storage Server computers. If the Exchange server is clustered, the report gives information about all storage groups on all virtual Exchange servers in the cluster.

The final section of the report logs errors and messages that were generated during the process. You can use this information to troubleshoot problems with a move. The log files are numbered sequentially and given the name *Detailed Report - 01.log*, *Detailed Report - 02.log*, and so forth. Each log file is stored in the My Documents\Windows Storage Server Logs\ folder of the current user.

When you use the Remote Storage Wizard, you can display the log file after the move is completed. WSSExchMove.exe includes a parameter for displaying the current configuration in the command window at any time.

To view a Detailed Report:

From the Remote Storage Wizard, on the completion page, select the View detailed report when the wizard closes check box to view a log file that contains the current configuration when the wizard completes.

-Or-

To view the results of a move that was just completed using WSSExcyMove.exe, open the most recent Detailed Report log file that was saved in your *My Documents\Windows Storage Server Logs* folder.

Note: To view a display of the current configuration of storage groups on the Exchange server at any time, at a command prompt on the Exchange server, enter wssexchmove /i.

---

For a description of the configuration information that the Detailed Report log file provides, see Appendix A, "Detailed Report Log Files." For help in troubleshooting problems with the remote storage tools, see Chapter 6, "Troubleshooting."

Exchange clusters

The Feature Pack supports the following Exchange server cluster configurations:

■ One or two 2-node active/passive Exchange clusters

■ One 2-node active/passive Exchange cluster and one standalone Exchange server

■ One 2-node active/active Exchange cluster

Figure 5 shows a network topology for one Windows Storage Server computer that hosts databases and transaction logs for two standalone Exchange servers. For each Exchange server, a dedicated network handles Exchange traffic to and from the Windows Storage Server computer.
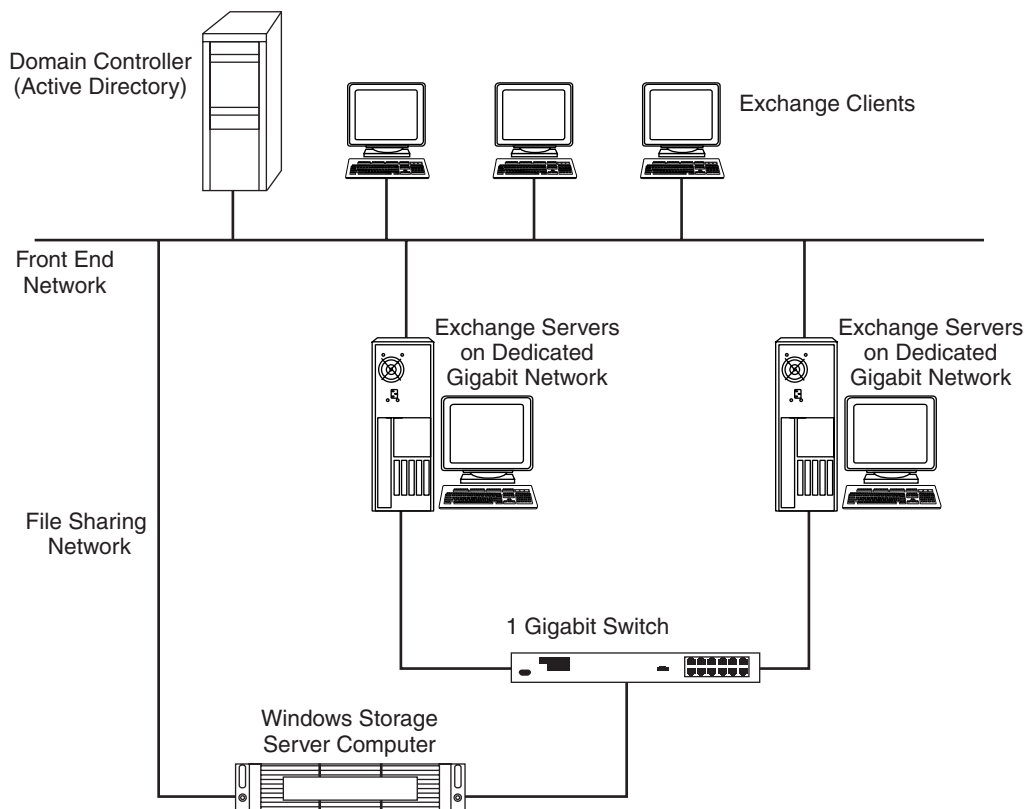
5008

Figure 5: Sample Network Topology for One Windows Storage Server Computer Hosting Storage Groups for Two standalone Exchange Servers

Active/passive clusters are recommended over active/active clusters, because they typically increase performance, availability, and scalability.

This section provides an overview of the basic requirements for deploying the Windows Storage Server computer with an Exchange server cluster.

For more information about Exchange clusters, including cluster capacity and configuration considerations, see the *Microsoft Exchange Server 2003 Deployment Guide* and the white paper, "Using Clustering with Exchange 2003: An Example," at http://www.microsoft.com/exchange/techinfo/deployment/2003.asp.

For information about how to administer and manage Exchange server clusters, see the *Microsoft Exchange Server 2003 Administration Guide*.

Remotely storing files from an active/passive Exchange cluster

The Feature Pack supports one or two 2-node active/passive Exchange clusters per Windows Storage Server computer, as shown in Figure 6. In the supported configuration, no more than two Exchange servers—one from each cluster—access the Windows Storage Server computer at any time. In each cluster, the passive server accesses the Windows Storage Server computer only if the active server fails.

This configuration requires a dedicated Gigabit Ethernet connection between each Exchange 2003 active/passive cluster and the Windows Storage Server computer. A dedicated Gigabit Ethernet connection is either a direct point-to-point connection, or is implemented through a switch that supports virtual LANs (VLANs). A separate connection to the front-end network is required for access to Active Directory and, optionally, to provide client access for general-purpose file sharing.
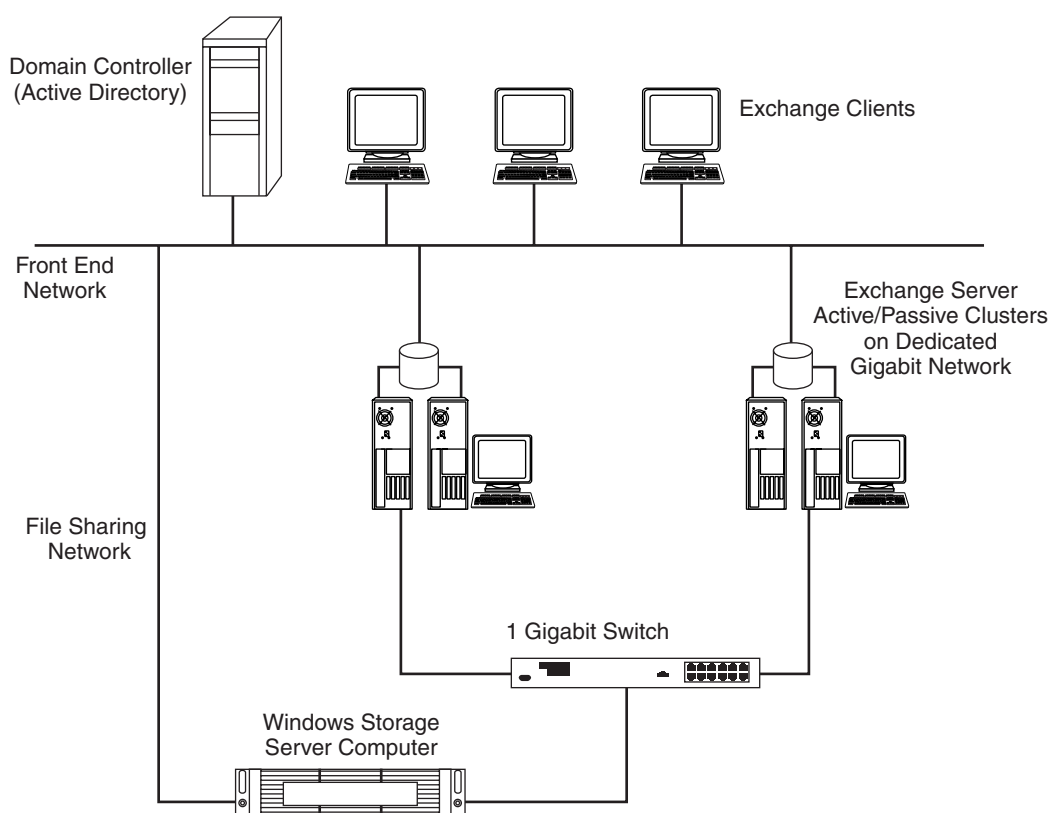
5009

Figure 6: Topology with two 2-node active/passive Exchange Server clusters

The Feature Pack also supports one 2-node active/passive Exchange cluster and one standalone Exchange server, as shown in Figure 7.
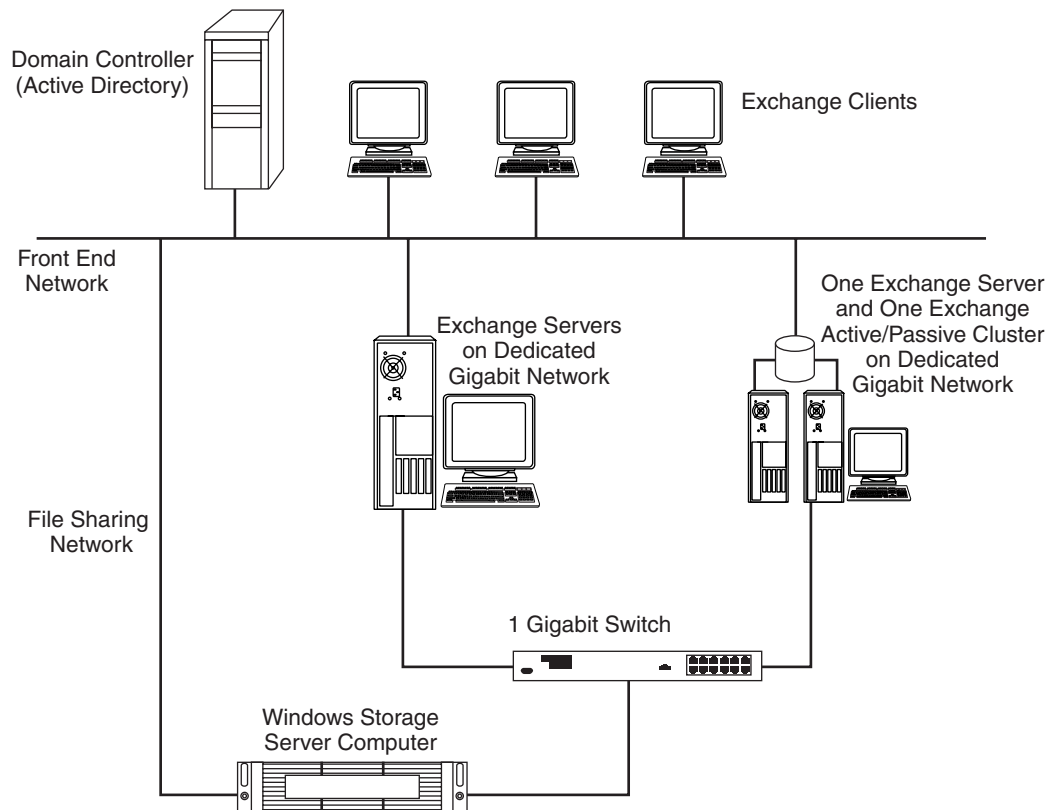
5010

Figure 7: Topology with one standalone Exchange server and one 2-node

Remotely storing files from an active/active Exchange cluster

The Feature Pack supports one active/active Exchange cluster, as shown in Figure 8. In the supported configuration, both Exchange servers in the cluster are active and access the Windows Storage Server computer at the same time. If one of the cluster nodes fails, the storage group operations of the failed node are handled by the other node, thereby preventing loss of service.

A dedicated Gigabit Ethernet connection is recommended between each Exchange 2003 server and the Windows Storage Server computer. A dedicated Gigabit Ethernet connection is either a direct point-to-point connection, or is implemented through a switch that supports virtual LANs (VLANs). A separate connection to the front-end network is required for access to Active Directory and, optionally, to provide client access for general-purpose file sharing.
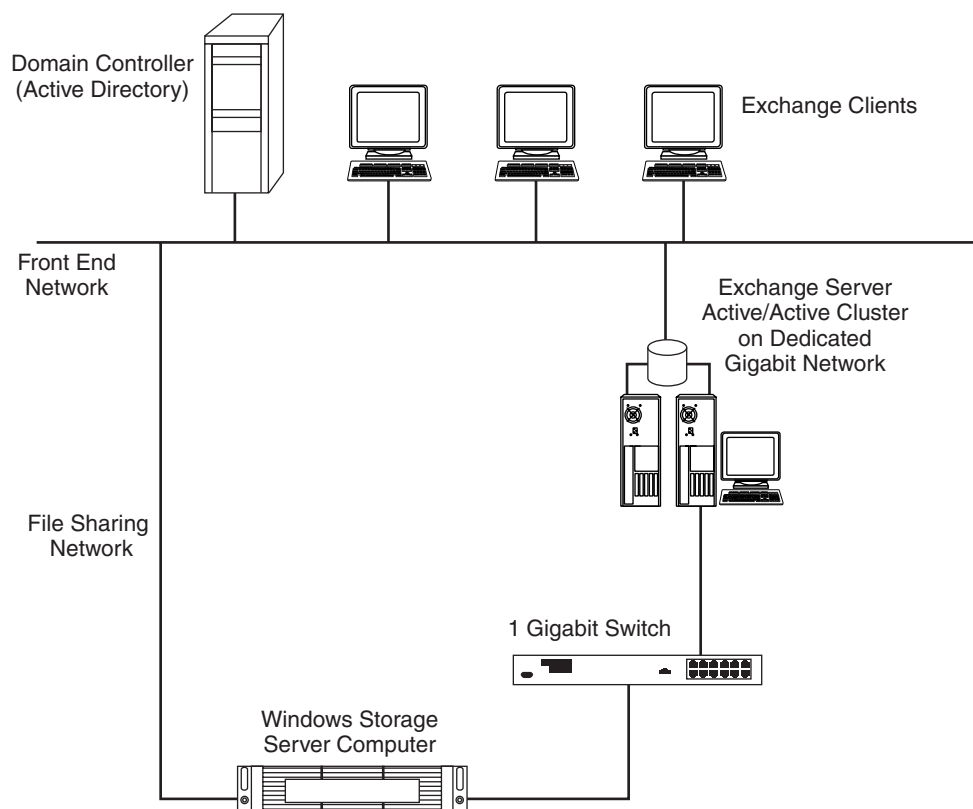
5011

Figure 8: Topology with one 2-node active/active Exchange Server cluster

Utilities and Applications

5

Using Exchange tools and applications with the Feature Pack

The Feature Pack is designed to work seamlessly with the Microsoft Exchange Server 2003 administrative applications and tools that are currently used to manage Exchange Server 2003 storage groups. However, whenever a storage group is remotely stored, the number of network calls that are required to perform basic database operations can increase. These basic database operations include defragmentation, backup, and restoration. This chapter provides information about Exchange database tools and applications that are used with the Feature Pack, as well as information about how to plan database processes to work with the location of Exchange databases and transaction logs.

Planning for the use of Exchange tools and applications with the Feature Pack

Exchange administrative tools and applications are used to perform database procedures that may require the transfer of data between servers and over the network. For example, data is typically transferred between the server that hosts the databases and transaction logs and either the Exchange server or a backup server.

The location of a tool or application relative to remotely stored Exchange databases and transaction logs can have a great impact on the amount of data transferred across the network and the amount of processing time that is required. The number of network data transfers depends on what kind of operation is requested.

Applications that access Exchange databases and transaction logs by using an Exchange streaming application programming interface (API), such as Backup Utility for Windows, require additional network data transfers. This is especially true if such an application is run from the Windows Storage Server computer. In this situation, data must travel from the Windows Storage Server computer to the Exchange server, and then from the Exchange server back to the Windows Storage Server computer.

When deciding where to place an Exchange tool or application in relation to the Exchange databases and transaction logs hosted by a Windows Storage Server computer, consider the effects of different system configurations. Select a system configuration that is most efficient for database operations. This configuration is probably one that minimizes the number of network data transfers and, in turn, the processing time that is required for database operations. For example, backup and restore operations are affected by the placement of Exchange databases in relation to the Exchange administrative tool or application, and by the addition of

optional backup servers. These factors determine the number of network data transfers that are required to complete a database process. The number of required network data transfers in turn affects processing time.

Table 11 shows the effects of three different network configurations on data transfers over the network during backup and restore operations.

Configuration 1, shown in Figure 9, has the following components:

■   An Exchange server running Windows NTBackup, with an attached tape device

■   A Windows Storage Server computer hosting the Exchange databases and transaction logs
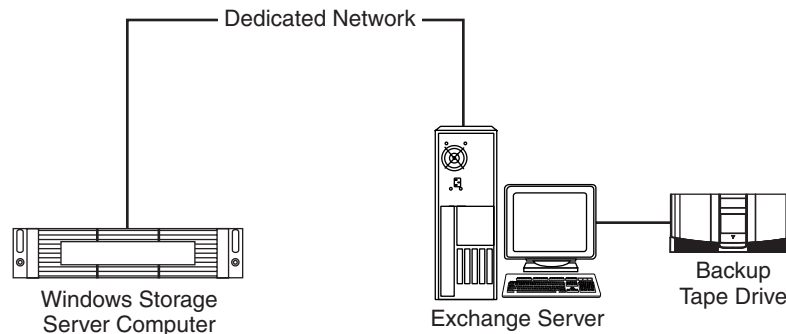
Figure 9: Configuration 1: Backup/restore on Exchange server

Configuration 2, shown in Figure 10, has the following components:

■   An Exchange server

■   A Windows Storage Server computer hosting the Exchange databases and transaction logs, and running Windows NTBackup, with an attached tape device
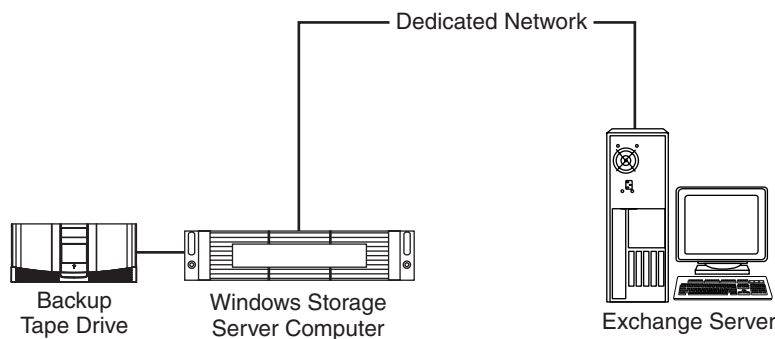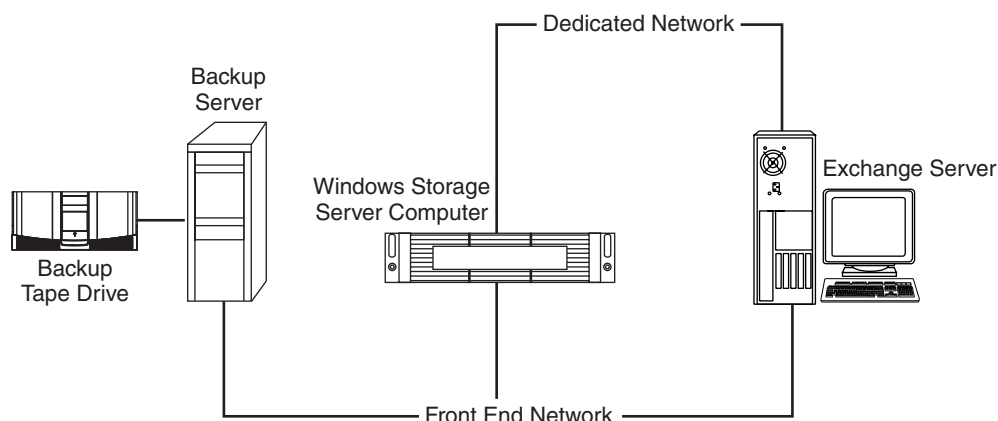

Figure 10: Configuration 2: Backup/restore on Windows Storage Server computer

Configuration 3, shown in Figure 11, has the following components:

■   An Exchange server

■   A Windows Storage Server computer hosting the Exchange databases and transaction logs

■   A standalone backup server

5015

Figure 11: Configuration 3: standalone backup server

Table 11 compares the number of network data transfers required for backup and restore operations under each of the three configurations.

Table 11: Comparison of network data transfers for backup and restore operations

Configuration of Network Data	Transfer for Backup	Network Data Transfers for Restore
Configuration 1 Backup/Restore on Exchange Server	One data transfer from the Exchange database on the Windows Storage Server computer to the backup device on the Exchange server.	One data transfer from the backup device on the Exchange server to the Exchange database on the Windows Storage Server computer.
Configuration 2 Backup/Restore on Windows Storage Server Computer	Two data transfers: One data transfer from the Exchange database on the Windows Storage Server computer to the Exchange server. One data transfer from the Exchange server to the backup device on the Windows Storage Server computer.	No data transfers over the network. Data is restored from the backup device on the Windows Storage Server computer to the Exchange database on the same server.
Configuration 3 Standalone Backup Server	Two data transfers: One data transfer from the Exchange database on the Windows Storage Server computer to the Exchange server. One data transfer from the Exchange server to the separate backup server.	One data transfer from the separate backup server to the Exchange database on the Windows Storage Server computer.

In general, applications that directly access Exchange databases or transaction logs should be run from the location of the databases or transaction logs. This configuration does not require network data transfers and may reduce processing time.

As described earlier, the location of Exchange administrative tools and applications affects the volume of network data traffic. Exchange tools and applications should be strategically located in relation to Exchange databases and transaction logs.

The following sections describe where to store administrative tools and applications to optimize processing.

Using ESEUtil.exe with the Feature Pack

The ESEUtil.exe utility allows an Exchange administrator to perform tasks on Exchange databases including defragmentation, repair, and recovery. ESEUtil.exe normally runs on the Exchange server.

When Exchange databases and transaction logs are stored remotely on a Windows Storage Server computer, it can be more efficient to run ESEUtil.exe procedures on the Windows Storage Server computer. This section describes the ESEUtil.exe procedures and provides information about the location from which each procedure should be run, for example, whether to run a specified procedure from the server that contains the Exchange database, from the Exchange server, or from the Windows Storage Server computer.

For more information about how to run the procedures that are described in this section, see "Additional resources for using ESEUtil.exe," later in this chapter.

Procedures to run from the server that contains the Exchange databases

The procedures that are described in Table 12 must be run from the server that contains the Exchange databases, whether that server is the Exchange server or the Windows Storage Server computer.

Table 12: ESEUtil.exe procedures that should be run from the server that contains the Exchange databases

Procedure	Description
Defragmentationeseutil /d	Makes used storage contiguous, eliminates unused storage, and compacts the database. Eseutil.exe copies database records to a new database. If there is insufficient space on the original server, the new database could be created on a different server. The function reads all of the records in the database at least one time and writes all records to a new database.If the defragmentation process creates a new database on a different server - for example, on a Windows Storage Server computer - run the defragmentation procedure on the server that contains the new database.For more information about defragmenting a database by using the ESEUtil.exe utility, see Microsoft Knowledge Base article 192185, "XADM: How to Defragment with the Eseutil Utility (Eseutil.exe)" (http://support.microsoft.com/default.aspx?scid=kb;enus;192185&Product=exch2003).

Table 12: ESEUtil.exe procedures that should be run from the server that contains the Exchange databases

Procedure	Description
Integrityeseutil /g	Confirms the integrity of the pages in the database, as well as the integrity of the data on the pages themselves. Reads the database at least one time.
Checksumeseutil /k	Confirms the integrity of pages in the database by recalculating the checksum on each database page. Reads the database at least one time.For more information about checking the integrity of a database by using the ESEUtil.exe utility, see Microsoft Knowledge Base article 825088: "How To: Use the Eseutil Utility to Detect File Header Damage in Exchange 2003" (http://support.microsoft.com/default.aspx?scid=kb;enus;825088&Product=exch2003).
Repaireseutil /p	Modifies parts of the database that are incorrect. The amount of repair work that is necessary depends upon the amount of corruption. Reads the entire Exchange database one time.For more information about repairing a database by using the ESEUtil.exe utility, see Microsoft Knowledge Base article 327156: "Error Message: The Database Files in this Storage Are Inconsistent" (http://support.microsoft.com/default.aspx?scid=kb;enus;327156&Product=exch2003).

Procedures to run either from the Exchange server or from the Windows Storage Server computer

The procedures that are described in Table 13 can be run either from the Exchange server or from the Windows Storage Server computer. Table 13 includes a separate recommendation about where to run each procedure.

Table 13: ESEUtil.exe procedures that can be run from different locations

Procedure	Description
Recoveryeseutil /r	Reads all log files that have not been committed to the database, and updates the database from the log records. Run this procedure from the Exchange server.
File Dumpeseutil /m	Displays the contents of a file on the screen. Run this procedure from either the Exchange server or the Windows Storage Server computer.
Copy Fileeseutil /k	Reads and writes the database one time. This operation runs faster than the normal file copy process, but only one file can be copied at a time. Run this procedure on either the Exchange server or the Windows Storage Server computer that stores the source file.

Additional resources for using ESEUtil.exe

For more information about using ESEUtil.exe, see the following resources:

■ To view a full listing of the syntax and parameters for each ESEUtil.exe procedure, type `Eseutil /?` at any command-line prompt on the Exchange server.

■   For more information about running ESEUtil.exe on a Windows Storage Server computer or on any server other than an Exchange server, see Microsoft Knowledge Base article 244525, "XADM: How to Run Eseutil on a Computer Without Exchange Server" (http://support.microsoft.com/default.aspx?scid=kb;en-us;244525&Product=exch2003).

Using Exchange applications with the Feature Pack

The operation of Exchange applications does not change after the Feature Pack is installed. Applications such as backup, restore, and recovery by using a Recovery Storage Group continue to work in the same way as they did before the Feature Pack was installed.

The Feature Pack does not support the use of Volume Shadow Copy Service (VSS) to back up an Exchange database that is stored on a Windows Storage Server computer, except in conjunction with third-party applications which provide that functionality, as discussed below.

Other third-party Exchange applications should function normally after the Feature Pack is installed. Contact the application vendor for the application to be used to determine if it is compatible with the Feature Pack.

Running backup and restore

Backups and restores of an Exchange storage group perform in the same way on the Windows Storage Server computer as they do on DAS or SAN storage. However, the location of the Exchange storage group in relation to the locations of the backup application and the backup tape drive can affect the amount of data that is transferred across the network and affect the processing time in turn. For this reason it is important to consider the effects of different system configurations when setting up backup and restore operations. For more information about how different system configurations can affect backup and restore operations, see "Planning for the use of Exchange tools and applications with the Feature Pack," earlier in this chapter.

During the restore process, the DFS root and links that were created by the Windows Storage Server Mapping Service redirect the restored data to the correct location on the Windows Storage Server computer. The application that is used for the restore process does not require additional information about the location of the Exchange databases and transaction logs.

If the tape drive that is used for the restore is attached directly to the Windows Storage Server computer, data does not have to go through the Exchange server. The backup application copies the contents from the tape and places them directly onto the Windows Storage Server computer by means of the DFS root redirection.

Using a Recovery Storage Group

The Recovery Storage Group feature allows a second copy of an Exchange database to be mounted on the same computer as the original Exchange storage group or on any other server in the same administrative group. This Recovery Storage Group can then be used to recover data without installing and configuring a separate Exchange recovery computer. To recover a database by using a Recovery Storage Group, the administrator moves the Recovery Storage Group to the server that will host the restored database. Once the move is complete, the restore process can begin. No network data transfer is required, which saves recovery time. The Feature Pack supports the use of Recovery Storage Groups for Exchange databases that are stored remotely on a Windows Storage Server computer. As with any storage group, either the Remote Storage Wizard or WSSExchMove.exe must be used to move the Recovery Storage Group to the Windows Storage Server computer. In this case, the move must be completed before the Recovery Storage Group is mounted and before the restore process begins. If the Recovery Storage Group is mounted or the restore operation has started, the Recovery Storage Group cannot be moved to the Windows Storage Server computer. Instead, a new Recovery Storage Group must be created.

For more information about creating and using a Recovery Storage Group, see "Using Exchange Server 2003 Recovery Storage Groups" at (http://www.microsoft.com/downloads/details.aspx?familyid=df144af6-bee5-4b35-866a-557e25fe2ba1&displaylang=en).

For more information about using remote storage tools to move Exchange storage groups, see Chapter 4, "Setup and Configuration."

Using the Volume Shadow Copy service

The Feature Pack does not redirect requests for a shadow copy from Volume Shadow Copy Service (VSS) to the Windows Storage Server computer. If VSS is initiated from the Exchange server, it cannot take a shadow copy of remotely stored files on the Windows Storage Server computer.

VSS can be initiated from a Windows Storage Server computer to make an offline shadow copy of Exchange files that are remotely stored on the Windows Storage Server computer. If the Exchange Information Store service is not stopped before the shadow copy is made, Exchange will continue to update Exchange databases and log files during the operation. This results in an inconsistent Exchange database or transaction log that cannot be used for data recovery. For more information about offline backup and restore procedures, see Microsoft Knowledge Base article 296788, "Offline Backup and Restoration Procedures for Exchange" (http://support.microsoft.com/default.aspx?scid=kb;en-us;296788).

The Feature Pack does not affect the ability to use VSS to protect non-Exchange files that are stored on the Windows Storage Server computer.

Troubleshooting

6

This chapter provides solutions to common problems that can occur when a NAS device running Microsoft Windows Storage Server 2003 is used to host Exchange databases and transaction logs.

Where multiple solutions are offered, the most common solution is presented first. Apply the solutions in the order in which they are presented.

Note: The most useful tool for troubleshooting the remote storage of Exchange files is the Detailed Report log file, which gives the current configuration of all storage groups that are owned by the Exchange server. A sequentially numbered Detailed Report log is stored in the My Documents directory tree of the current user each time the Remote Storage Wizard or WSSExchMove.exe is run. For information about the contents of the Detailed Report, see Appendix A, "Detailed Report Log Files."

What do I do if my installation is not successful?

Solution: Eliminate sources of interference, and repeat the installation.

1. Close all open applications and install Microsoft Windows Storage Server 2003 Feature Pack (Feature Pack) again.

2. If a second installation does not succeed, restart the Exchange server, and then repeat the installation.

How can I determine which version of the Feature Pack is installed on the server?

Solution: View the Feature Pack version number on the server or print a report that includes it.

To view the version number of the Feature Pack that is installed on the server, use Add and Remove Programs. In Control Panel, click Add and Remove Programs, click Windows Storage Server 2003 Feature Pack, and then click Click here for support information.

-Or-

To print a Detailed Report that includes the version number of the Feature Pack, type the following at a command prompt on the Exchange server: `wssexchmove /i` The version number for the Feature Pack is listed at the beginning of the report.

How can I determine which shares are hosting my Exchange databases and transaction logs?

Solution: View a configuration summary for Exchange storage groups.

To view a Detailed Report that contains the current configuration of the Exchange storage groups on the server, type the following at a command prompt: `wssexchmove /i`

My move did not complete successfully because shares could not be accessed

Solution: Verify that the shares exist, and assign missing permissions

1. To verify that the shares exist:

    a. View a Detailed Report that contains a current configuration summary for the Exchange storage groups. At a command prompt on the Exchange server, type: `wssexchmove /i`

    b. In the "Distributed File System Structure" section, confirm that the shares exist and that the state of each link target is Pass.

2. For any link target that is not in Pass state, confirm that the computer account for the Exchange server has the following permissions:

    ■ Full Control permission for the share that hosts the Exchange files

    ■ Full Control permission for the underlying folder that is associated with the share

3. Assign the required permissions for the shares and for the underlying folders.

4. Use a remote storage tool to perform the full move again.

My move did not complete successfully because the databases could not be remounted

Solution: Troubleshoot problems with the Exchange databases.

When completing a full move, the remote storage tool attempts to mount any Exchange stores that were involved in the move. If the stores cannot be mounted, the move operation does not complete successfully, and an error message identifies the problem.

If the remote storage tool was able to access the Exchange shares on the Windows Storage Server computer and move the files to the shared folders (that is, inadequate permissions did not interfere with the move) but was unable to remount the store after moving the database, a problem with the Exchange database probably is preventing the store from mounting. For information about troubleshooting problems with Exchange databases, see KB328763, "Troubleshooting a Corrupted Exchange Database," in the Microsoft Knowledge Base (http://support.microsoft.com/default.aspx?kbid=328763).

The DFS root or DFS links are missing on the Exchange server

If the DFS root that is used by Exchange or the DFS links that are assigned to Exchange shares on Windows Storage Server computers are missing, you may be able to recreate the DFS root or DFS links by restarting the Windows Storage Server Mapping Service. If restarting the Windows Storage Server Mapping Service does not recreate the DFS root or the DFS links, the Feature Pack must be reinstalled.

Note: The method which is used to view and update the permissions that are assigned to the share depends upon how the share was created. If the Web user interface (WebUI) for Windows Storage Server Administration was used to create an Exchange share, properties for the share can be viewed and updated by using the WebUI. For information about working with shares in the WebUI, see Help for the WebUI. If the share was set up by using Windows Explorer, view and update the properties of the share by using Windows Explorer. For information about setting up shares in Windows Explorer, see Help and Support Center for the Microsoft Windows Storage Server 2003 operating system or the Windows 2000 operating system.

Solution 1: Recreate the DFS root and DFS links by restarting the Windows Storage Server Mapping Service

1. Restart the Windows Storage Server Mapping Service:

   a. On the Program menu, click Administrative Tools, and then click Component Services.

   b. In the console tree, click Services (Local).

   c. In the detail pane, right-click Windows Storage Server Mapping Service, and then click Restart.

   The service rebuilds the DFS structure that is used for Exchange shares on Windows Storage Server computers and then stops.

2. To check whether the DFS root and links were created, view a Detailed Report that lists the current configuration of storage groups on the server. At a command prompt on the Exchange server, enter: wssexchmove /i

   The "Distributed File System Structure" section identifies the DFS root and the DFS links, and tells the state of each DFS link (Pass or Fail).

3. If the DFS links are still missing, restart the Exchange server. Restarting the Exchange server automatically restarts the Windows Storage Server Mapping Service.

Solution 2: Reinstall the Feature Pack; then perform a configuration update to recreate the DFS links.

> **Caution:** Before you uninstall the Feature Pack, it is important to verify that all remotely stored Exchange databases were shut down cleanly. If you reinstall the Feature Pack while corrupted databases are stored on Windows Storage Server computers, recovery procedures in Exchange might not work correctly for those databases.

1. To verify that the Exchange databases shut down cleanly, check the state of the databases. For each Exchange database that is stored on the Windows Storage Server computer, perform the following steps:

   a. On the Exchange server, navigate to the *%ProgramFiles%\Exchsrvr\bin* folder.

   b. At a command prompt, type the following to view the first 4 kilobytes (KB) of the database file: esutil /mh filename.edb

   c. In the State field, verify the state of the database: Clean Shutdown or Dirty Shutdown. If the Exchange databases did not shut down cleanly, you will need to fix the problems with the databases. For information about troubleshooting problems with Exchange databases, see KB328763, "Troubleshooting a Corrupted Exchange Database," in the Microsoft Knowledge Base (http://support.microsoft.com/default.aspx?kbid=328763).

2. If all remotely stored databases were shut down cleanly, dismount all stores on the Exchange server. For a clustered Exchange server, dismount all databases on the virtual server. This ensures that the reinstallation does not corrupt any remotely stored database that is functioning and online during the process.

3. Reinstall the Feature Pack.

   You must uninstall the Feature Pack before reinstalling the same Feature Pack version. Reinstalling the Feature Pack creates the DFS root and local drive mapping that Exchange uses.

4. To recreate the DFS links to Exchange shares on the Windows Storage Server computer, perform a configuration update for each storage group that the server hosts. You must do this for all databases, not just the ones that had been corrupted.

   For instructions for moving Exchange files to a Windows Storage Server computer, see Chapter 4, "Setup and Configuration."

5. Mount the stores in Exchange.

6. After you remount each store, back up the Exchange database immediately.

The mapped drive that Exchange uses was deleted or is not being created

If the mapped drive that Exchange uses was deleted or is not being created, another application or process might be using the designated drive. If the designed drive is already in use, you can resolve the problem by changing the drive letter that Exchange uses. However, before you change the local drive letter that Exchange uses, try to solve the problem by restarting the Windows Storage Server Mapping Service.

Solution 1: Restart the Windows Storage Server Mapping Service to recreate the drive mapping for the DFS root

1. Restart the Windows Storage Server Mapping Service:

   a. On the Program menu, click **Administrative Tools**, and then click **Component Services**.

   b. In the console tree, click **Services (Local)**.

   c. In the detail pane, right-click **Windows Storage Server Mapping Service**, and then click **Restart**.

   The service recreates the mapped drive that is used for the standalone DFS root and then shuts down.

2. If restarting the Windows Storage Server Mapping Service does not recreate the drive mapping for the DFS root, try restarting the Exchange server. Restarting the Exchange server restarts the Windows Storage Server Mapping Service, which recreates the mapped drive that is used for the DFS root.

Solution 2: Change the drive letter being used for Exchange shares

> △ **Caution:** Before changing the drive letter that Exchange uses, it is important to verify that all of the Exchange databases that are stored on a Windows Storage Server computer shut down cleanly. If the drive letter is changed while a corrupted Exchange database is stored on the Windows Storage Server computer, normal recovery routines might not work correctly.

1. Before changing the mapped drive that Exchange uses, verify that the Exchange databases are clean:

   a. On the Exchange server, navigate to the *%ProgramFiles%\Exchsrvr\bin* folder.

   b. At a command prompt, type the following to view the first 4 KB of the database file:
   `esutil /mh filename.edb`

   c. In the State field, verify the state of the database: Clean Shutdown or Dirty Shutdown.

      If the Exchange databases did not shut down cleanly, you will need to fix the problems with the databases. For information about troubleshooting problems with Exchange databases, see KB328763, "Troubleshooting a Corrupted Exchange Database," in the Microsoft Knowledge Base (http://support.microsoft.com/default.aspx?kbid=328763).

If the Exchange databases were shut down cleanly, something else is interfering with the drive mapping. It is possible that a newly installed application is starting more quickly than the Feature Pack and using the drive letter. To resolve this problem, remap the drive that is used for Exchange shares on the Windows Storage Server computer to a different drive letter.

2. If the databases were shut down cleanly, use the WSSExchMove.exe command-line tool to map a different drive letter for use by Exchange. At a command prompt on the Exchange server, type: `wssexchmove /m driveletter`

All DFS links for Exchange shares on the Windows Storage Server computer are automatically mapped to the new drive letter.

Detailed Report Log Files

A

Viewing a detailed report log file

Whenever a remote storage tool is used to move Exchange databases or transaction logs to a Windows Storage Server computer, a Detailed Report log file is saved. The Detailed Report describes the current configuration of storage groups on the Exchange server, and the status of the shares that are currently being used to host Exchange databases and transaction logs. The log files are numbered sequentially and given the name *Detailed Report - 01.log*, *Detailed Report - 02.log*, and so forth. Each log file is stored in the *My Documents\Windows Storage Server Logs* folder of the current user.

To view the current configuration of storage groups at any time, you can use WSSExchMove.exe to display a Detailed Report that contains the current configuration.

To view a Detailed Report:

■   At any command prompt on the Exchange server, type: `wssexchmove /I`
    This command displays the current configuration of storage groups on the Exchange server in the command windows in Detailed Report format.

    -Or-

■   From the Remote Storage Wizard, on the completion page, select the View detailed report when the wizard closes check box to view a log file that contains the current configuration when the wizard completes.

To view an existing Detailed Report log file:

In the *My Documents\Windows Storage Server Logs* folder, open the log file of interest. Each log file is named *Detailed Report - n.log*, where n is a sequentially assigned number that uniquely identifies the log in the My Documents directory tree of the Exchange administrator who performed the move operation.

Contents of the detailed report

The Detailed Report log file includes five sections, which provide detailed information about the locations and status of the transaction logs and databases for Exchange storage groups on the local Exchange server. For a cluster of Exchange servers, the report gives the configuration for each virtual server in the cluster. Table 14 describes the sections of the Detailed Report log file.

Table 14: Sections of the detailed report log file

Report	Description
Report header	Identifies the version of the Feature Pack and the date when the report was generated.
"Storage Group"	Identifies the locations of transaction logs, system files, and database stores for an Exchange storage group. The report includes a separate section for each storage group on the Exchange server. For an Exchange cluster, a section is included for each storage group on each virtual server in the cluster.
"Mapped Drive"	Identifies the drive letter on the local Exchange server that is being used for Exchange shares on Windows Storage Server computers.
"Distributed File System Structure"	Identifies the DFS root and the link name, link target, and status of each DFS link associated with Exchange files that are stored remotely on Windows Storage Server computers.
"WSSExchMapSvc"	Identifies the mode and state of the Windows Storage Server Mapping Service (WSSExchMapSvc).
"Errors and Warnings Encountered During Execution"	Lists errors and warnings that were encountered during any operations that were requested when the Detailed Report log file was generated.

Each section of the report is described in greater detail in the sections that follow.

Report header

The report header identifies the current Feature Pack release, and the date and time when the report was generated.

■   Version Information—The version number of Windows Storage Server 2003 Feature Pack that is installed.

■   Performed On Date—The date and time when the report was generated.

Storage Group

Each "Storage Group" section in the Detailed Report log file gives the configuration of transaction logs, system files, and stores for a storage group. The log file contains a "Storage Group" section for each storage group on the local Exchange server. For an Exchange cluster, the log file contains a "Storage Group" section for each storage group on all virtual servers in the cluster.

To identify problems with the storage group configurations, it is necessary to understand the difference between the Current Location and the location that is stored in Microsoft Windows Storage Server 2003 Active Directory directory service (the AD Location) for the transaction logs and stores.

If the transaction logs or database files are stored on the local Exchange server, the Current Location and the Current AD Location should be identical.

If the transaction logs or database files are stored on a Windows Storage Server computer, the Current Location is a Universal Naming Convention (UNC) path to the transaction logs, and the Current AD Location contains the mapped drive version of the UNC path, which Exchange uses.

For example, remotely stored Exchange transaction logs with the UNC path *\\storageserver01\Exchange_TLOGS* might have an AD location of *S:\{storageserver01.0}*, where S: is the local drive letter mapped for Exchange shares on Windows Storage Server computers and {storageserver01.0} is the link name that was assigned when the transaction logs were moved to the Windows Storage Server computer, storageserver01.

If these two addresses point to the same physical location, the link target for the link matches the UNC path in the Current Location. To check this, look for the Link Target that is associated with the Link Name in the "Distributed File System Structure" section, later in the Detailed Report log file. The link name is the portion of the AD Location that is enclosed in curly brackets; the curly brackets are part of the name. In the example, the Link Target for the {storageserver01.0} link is *\\storageserver01\Exchange_TLOGS*, indicating that the two settings represent the same physical location.

Log Files

The "Log Files" section reports whether any action was taken on the transaction logs for the Exchange storage group, and indicates both their physical location and the location that is configured in Active Directory.

Table 15: Log File descriptions

Item	Description
Original Location	The location of the transaction logs on the Exchange server before any action was taken.
Action Requested	The action that was performed on the transaction logs: Configuration Update, Full Move, or None.
Action Result	The result of the requested action, indicating whether the operation succeeded or failed.
Current Location	The physical path of the transaction logs after any requested action was performed. If the logs are stored on the local Exchange server, this is the full path to the destination folder. If the logs are stored on a Windows Storage Server computer, this is the UNC path of the destination share - for example, \\storageserver01\Exchange_TLOGS.
Current AD Location	The path that is currently stored in Active Directory, which Exchange uses to locate the transaction logs. If the logs are stored on a Windows Storage Server computer, this is the mapped drive version of the UNC path - for example, S:\{storageserver01.0}.

System Files

The "System Files" section reports the Current Location and the AD Location for the system files for the Exchange database. Because the remote storage tools do not move these files, the Current Location and the AD location should be a local path on the Exchange server, and the two locations should be identical.

■ Current Location—The physical path of the system files.

■ Current AD Location—The path that is currently stored in Active Directory, which Exchange uses to locate its system files.

Store

Each "Store" section reports the configuration of the database files in a store. The configuration of the database (.edb) file is listed separately from the configuration of the streaming database (.stm) file. Because the remote storage tools move the .edb and .stm files for a store to the same destination at the same time, the configuration of any databases that have been moved by using one of the tools should be identical except for the file names.

Table 16: Store descriptions

Item	Description
Original Location	The location of the database file on the Exchange server before any action was taken.
Action Requested	The action (if any) that was performed on the database file: Configuration Update, Full Move, or None.
Action Result	The result of the requested action, indicating whether the operation succeeded or failed.
Current Location	The physical path of the database file after any requested action was performed. If the database file is stored on the local Exchange server, this is the full path to the .edb file on the local computer. If the database file is stored on a Windows Storage Server computer, this is the UNC path of the database file - for example, \\storageserver01\Exchange_DB\mail1.edb.
Current AD Location	The path that is currently stored in Active Directory, which Exchange uses to locate the database file. If the database file is stored on a Windows Storage Server computer, this is the mapped drive version of the UNC path - for example, S:\{storageserver01.1}\mail1.edb.

Mapped Drive

The "Mapped Drive" section provides the following information about the mapped drive that Exchange is using for databases and transaction logs that are stored on Windows Storage Server computers.

Table 17: Mapped Drive descriptions

Item	Description
Original Location	The UNC path of the mapped drive before any action was taken - for example, \\Exchange01\S$.
Action Requested	The action that was performed on the mapped drive: Configuration Update or None.
Action Result	The result of the requested action, indicating whether the operation succeeded or failed.
Current Location	The UNC path of the mapped drive after any requested action was performed.

By default, the Exchange shares are mapped to the S: drive when the Feature Pack is installed. If the S: drive is already in use, the next available drive letter on the Exchange server is assigned. An organization can change the mapped drive, automatically updating the configuration of the DFS root and DFS links on the Exchange server, by using the /m parameter with WSSExchMove.exe. For more information about the syntax of this command, see Chapter 4, "Moving Exchange files to a Windows Storage Server computer."

Distributed File System Structure

The "Distributed Files System Structure" section summarizes the elements of the Distributed File System (DFS) structure that is currently in use for Exchange files on Windows Storage Server computers. The Feature Pack uses a mapped drive in combination with the DFS to enable the remote storage of Exchange files on Windows Storage Server computers.

DFS Root

The "DFS Root" section identifies the DFS root folder and root name that Exchange is using.

■ DFS Root Folder—The folder that is hosting the standalone DFS root on the Exchange server. This will be the absolute path of *%ProgramFiles%\Windows Storage Server\Exchange\DFS*.

Note: Do not move, rename, or remove this folder at any time.

■ DFS Root Name—The name of the DFS root. This should correspond to the drive letter that is being used for the mapped drive. By default, letter S is used for the mapped drive, and the DFS root name is S$.

DFS Links

The "DFS Links" section provides the following information about each DFS link that has been created for Exchange shares on the Exchange server.

Table 18: DFS Links descriptions

Item	Description
DFS Link	The name given to the DFS link. The format of this name is { storageserver. n}, where storageserver is the name of the destination Windows Storage Server computer and n is a sequentially assigned number that uniquely identifies the link on the Windows Storage Server computer. The curly brackets ({ }) are included in the name. A separate link is created for each .edb file and each .stm file for each store; a single link is created for all transaction logs for the storage group.
Link Target	The UNC path to the destination location of the link - for example, \\storageserver01\Exchange_TLOGS. For transaction logs, the link target should match the Current Location that is presented in the "Storage Group Information" section. For a database file, the link target should be the Current Location without the file name.
State	The current state of the Server Message Block (SMB) share located at the link target: Pass or Fail - Share not found. To have Pass state, the share must exist and be accessible.For the share to be accessible, the Windows Storage Server must be online, the Exchange server must have Full Control permission for the share as well as the underlying folder, and the Exchange administrator who is performing the current operation must have the same permissions.

WSSExchMapSvc

The "WSSExchMapSvc" section indicates the status and run mode of Windows Storage Server Mapping Service, a service that creates the mapped drives and link targets that Exchange uses to recognize Exchange storage groups that are stored on Windows Storage Server computers.

- Current Status—The current status of Windows Storage Server Mapping Service: Running, Stopped, or Unknown. Note: Windows Storage Server Mapping Service is only active for only a short period when the Exchange server is restarted or when the Exchange Information Store Service is started. After the Windows Storage Server Mapping Service verifies the existence of the DFS root and DFS links, and verifies access to the shares that are associated with the DFS links, the service shuts down. A status of Stopped is normal.

- Run Mode—The current run mode of Windows Storage Server Mapping Service: Automatic, Manual, Disabled, or Unknown. For the Feature Pack to operate correctly, always set Run Mode to Automatic.

Errors and Warnings Encountered During Execution

The "Errors and Warnings Encouraged During Execution" section concludes the Detailed Report log file. This section lists all errors and warnings that were encountered during any operations that were requested when the Detailed Report log file was generated.

Additional Resources

B

Planning security

- For security guidelines for an Exchange server running Microsoft Exchange Server 2003, see Planning an Exchange Server 2003 Messaging System (http://go.microsoft.com/fwlink/?LinkId=23131).

- For detailed information about security requirements for a Windows Storage Server computer, see the Microsoft Windows Storage Server 2003 OEM Training Guide.

Installing the Feature Pack

- For detailed instructions for installing the Feature Pack on the Windows Storage server computer and the Exchange server, see the Microsoft Windows Storage Server 2003 Feature Pack Installation Guide, located in *%ProgramFiles%\Windows Storage Server\Exchange\Installation_Guide.doc*.

- For information about creating and configuring disk drives, see Help and Support Center for the Microsoft Windows Storage Server 2003 operating system.

- For information about Windows Installer arguments, see "Command Line Options" in the Windows Installer documentation in the Platform Software Development Kit (PSDK) at the Microsoft web site: (http://msdn.microsoft.com).

Moving Exchange files to a Windows Storage Server computer

- For information about using the Remote Storage Wizard or the WSSExchMove.exe command-line tool to move Exchange databases and log files to a Windows Storage Server computer, see Help for Remote Storage Tools for Exchange (*%ProgramFiles%\Windows Storage Server\Exchange\RemoteStorage.chm*, on the Exchange server).

- For information about using the Microsoft Web User Interface for Windows Storage Server Administration (WebUI) to create Server Message Block (SMB) shares to host Exchange files on a Windows Storage Server computer, see Help for the WebUI.

- For information about using Windows Explorer to create SMB shares to host Exchange files on a Windows Storage Server computer, see Help and Support Center for Microsoft Windows Storage Server 2003.

Administering Exchange databases

■ For general information about using Exchange Server 2003 to perform database administration, see the Microsoft Exchange Server 2003 Administration Guide on the Microsoft TechNet site: (http://go.microsoft.com/fwlink/?LinkId=21769).

■ For information about creating storage groups in Exchange 2003, see Help for Exchange System Manager.

■ For information about using Recovery Storage Groups in Exchange, see "Using Exchange Server 2003 Recovery Storage Groups:" (http://go.microsoft.com/fwlink/?LinkId=23121).

■ For general information about troubleshooting problems with Exchange databases, see Microsoft Knowledge Base article 328763, "Troubleshooting a Corrupted Exchange Database:" (http://go.microsoft.com/fwlink/?LinkId=23122)

■ For information about running ESEUtil.exe on a Windows Storage Server computer or on any server other than an Exchange server, see Microsoft Knowledge Base article 244525, "XADM: How to Run Eseutil on a Computer Without Exchange Server:" (http://go.microsoft.com/fwlink/?LinkId=23123) (http://support.microsoft.com/default.aspx?scid=kb;en-us;244525&Product=exch2003).

■ For information about defragmenting a database by using the ESEUtil.exe utility, see Microsoft Knowledge Base article 192185, "XADM: How to Defragment with the Eseutil Utility (*Eseutil.exe*):" (http://go.microsoft.com/fwlink/?LinkId=23124)

■ For information about checking the integrity of a database by using the ESEUtil.exe utility, see Microsoft Knowledge Base article 825088: "How To: Use the Eseutil Utility to Detect File Header Damage in Exchange 2003:" (http://go.microsoft.com/fwlink/?LinkId=231250).

■ For information about repairing a database by using the ESEUtil.exe utility, see Microsoft Knowledge Base article 327156: "Error Message: The Database Files in this Storage Are Inconsistent:"(http://go.microsoft.com/fwlink/?LinkId=23126).

Testing performance of the Exchange server

■ For more information about LoadSim or to download the tool, see Microsoft Exchange 2003: Load Simulator 2003 on the Microsoft Download Center web site: http://go.microsoft.com/fwlink/?LinkId=23364.

■ For more information about the MMB3 user profile, see Exchange Server 2003 MAPI Messaging Benchmark 3 (MMB3) on the Microsoft Exchange Server web site: (http://go.microsoft.com/fwlink/?LinkId=23367).

Index